GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

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STRAY STRAWS FROM DR C. C. MILLER

PUT THIS DOWN as a rule, that it's worse than waste time to level down sections any more than to remove the soiled edges.

AN APOLOGY is due from Hasty to Mrs. Bee for saying that "Mr." Bee knows "his" own business best in seeking nectar in the right place.—*Review*, 306.

THE OLDER bees are, the smaller loads of pollen they carry. A Belgian journal says this is because the hairs on their legs are rubbed off as they grow older.

THOSE EXPERIMENTS of Fr. Greiner, p. 794, are very interesting. Now let him determine whether a queen takes 15 or 16 days from the laying of the egg in a strong colony.

R. L. TAYLOR thinks bees gather more pollen in the morning because, in many varieties, as in corn, "the pollen is either gathered by the bees or falls away to do its proper work early in the day, so the bees have none to gather later."

I DON'T SEE the entire appropriateness of Mr. Taylor's wicker chair in the matter of ventilating supers, but I'm entirely with him in believing that a gap in a separator doesn't help ventilation which is up and down, not sidewise.—[I differ from you both.—ED.]

EDITOR HUTCHINSON has spoken of the natural comb in sections being "friable," and now, *Review*, 318, he speaks of its "brittle character." Surely, that can hardly be a matter of "locality." I never saw any friable or brittle comb unless it was very old and dry, or else very cold.

CRITIC TAYLOR quotes a Straw on page 645, and says I overlook that Doolittle says Nature's plan is to put the *first* eggs in the center. Bro. Taylor, I think you're the overlooker. Look at p. 513 and 624 again; and if I understand the English language Doolittle says it's Nature's plan to lay *all* the eggs in the center, "where they should be."

S. A. ROBERTS is right, p. 802. I'd "feel a lot happier" if I could winter outdoors. But, friend Roberts, whenever I try it I lose five times as many colonies as in the cellar. Perhaps you have a more sheltered location. [It is just the other way here, doctor — so much for locality; and yet I am not sure but if I were in Marengo I should winter just as we do here in Medina.—ED.]

THE TWO THINGS bee-keepers are most anxious about are:

1. How to get a crop of honey.
2. How to get rid of it.

[If there were nothing further to learn by way of solution of these two questions, there would be no use for bee-journals or bee-books. —ED.]

IN EUROPE, bee-journals don't keep up to date as close as on this side. Reports of the big German convention are strung through the journals for many months. In October *L'Apiculteur*, a leading French journal, the dates of the 14 letters from correspondents run from Feb. 2 to Aug. 29, the average date of all being July 25.

GEOGRAPHICAL DISTANCES may account for the greater numbers that attend German conventions, but you can't account in that way for the thousands of members that don't attend. [It only emphasizes the fact that we can, if we take the right course, increase the membership of the U. S. B. K. U. to a size equal to that of any German association.—ED.]

SOME TIME AGO mention was made of plain sections being used by Morrison or some one else, without separators. As yet I think we have not been told how they were spaced apart. I'm curious to know. [As yet no communication has come in from Mr. Morrison regarding the manner in which he would separate the plain sections. If he sees this I trust he will enlighten us.—ED.]

THE *Review* has been getting "views" as to the Department of Criticism. The consensus of opinion is that the department fills "a long-felt want," and is doing a grand work. Wonder if that's another illustration of the fact that successes are reported more freely than failures, and that replies to such calls will bring responses only from those favorably inclined. [Notwithstanding I *know* the past season has been one of general failure, so far as honey is concerned, we have had more

reports this year encouraging than discouraging. I believe it is true that it is easier to report successes than failures. Yes, it is easier to commend a publisher for following a certain course than to do otherwise —ED.]

TO THE QUESTION in *American Bee Journal*, "In casing comb honey for shipment to market, what would be your rule as to the row of sections next to the glass?" only four or five of the twenty-two repliers seem to favor having them better than the rest of the case. The remainder agree with Doolittle, who says "that they be as good as the average of those in the case, then turn 'face' side out." I think that's the ground Doolittle has held all the time, but he has allowed himself to be misunderstood.

E. E. HASTY, in *Review*, proposes to stand up beside Editor Root against Editor Hutchinson and me, because he *never noticed* that bees disliked black more than white. But, friend Hasty, the testimony of a man who saw me commit theft is not killed by the testimony of another who did *not* see the theft. [In view of the overwhelming testimony to the effect that bees do regard with disfavor the color black, I have been obliged to acknowledge that I was wrong. Sorry, Hasty, to get on the other side of the fence when you so kindly offered to stay on my side.—ED.]

THE APIS DORSATA in the Philippines, as reported in Chicago *Tribune*, is "the largest variety of this species." They are such persevering workers that they have lost dexterity with their stinging apparatus, "and it takes them 20 or 30 seconds to get their sting in working order." [You do not say, doctor, whether or not you believe this statement. I am under the impression that *Apis dorsata* can sting, and sting viciously. I should doubt very much whether the average native or European would allow a bee of this sort to remain on any portion of his exposed anatomy for 20 or 30 seconds, trying or getting ready to sting. It must get in its work in a much shorter time.—ED.]

THOSE QUEEN-CELLS, p. 647, seemed to me a little too pointed. Critic Taylor says, "If our friends will have patience those cells will all be nicely rounded off within a few days. I have never noticed any difference in the shape of the points of cells internally; but often, after cells are capped, the bees decorate the free end with a point of wax and pollen; but this is all carefully removed before the cells are ready to be opened by the inclosed queens." And no doubt he is right. [Mr. Taylor may be partly right; but we had one colony last summer that seemed more inclined to build pointed cells than rounding. It was the best cell-builder we had. Yes, I know bees will sort o' sandpaper off the ends of the cells just before hatching.—ED.]

I BELIEVE you wrong Mr. Taylor, page 807, Mr. Editor, when you call his reference to Doolittle "sarcastic." Please don't think that, because he makes too free use of sarcasm, *every* thing he says must be sarcastic. The strength of Doolittle's name *does* add weight to his testimony, and that added weight makes it "heavy testimony." I think Mr. Taylor was speaking honestly and not sarcastically. Please apologize for misjudging him. [Perhaps you are right; but when I first read it over, and even now as I read it, the impression seems the same. However, I do not wish to place any wrong accusation against our friend, and I therefore gladly give him the benefit of the doubt.—ED.]

MEASUREMENTS in fractions of an inch are given in *L'Apiculteur* as follows:

	Length.	Width, tip to tip of wings.	Diameter of thorax.
Queen.....	.63 to .71	.95	.177
Worker ...	.47 to .51	.90	.157
Drone.....	.59	1.10	.216

[I have experimented quite extensively with perforated zinc, and have found that $\frac{162}{1000}$ was about as narrow as a bee could get through. But $\frac{165}{1000}$ is about the correct figure, if my experiments mean any thing. I notice in the table above that the size of worker is given as $\frac{157}{1000}$ at the thorax. I should be inclined to believe it correct, for if any larger it could hardly squeeze through any thing smaller than $\frac{162}{1000}$.—ED.]

L. A. ASPINWALL, in *Review*, p. 298, speaks as though Editor Root and I had been using slang. I plead not guilty. I am in accord with friend A. in his liking for pure language, have always opposed the use of slang, and if he will point out the place where I ever indulged in it I shall be greatly obliged, and will try to avoid a repetition of the offense. [Look here, doctor, you are real mean. You place the responsibility for the alleged use of slang upon *my* shoulders. I, too, will plead not guilty — that is, if "scrooch" for "crouch," "smoled" for "smiled," and "canine" for "dog" are not slang, as I firmly believe they are not. Inadvertently I may have used a word that might be so classed by competent judges, but I do not now recall it. Slang, as Mr. Taylor says, has its birth in places of low resort. I can not believe that the words I have used had their origin in such places; but, after all, may be it is a good thing to have a shaking-up on this subject, providing it tends to purer language.—ED.]

REPLYING to your footnote at the bottom of p. 790, I don't know how much flavor is imparted to honey by comb, but I don't believe any that the most careful tasting would ever appreciate. New comb *has* a flavor of its own, but I don't think that flavor soaks into the honey, and the flavor of the comb is so exceedingly mild that I think it's entirely lost when honey is in the mouth. [All I know is, as I have stated before, that visitors often remark regarding the beautiful aroma that they detect when going into our wax-room. They say it smells like honey, and yet there is not a pound of honey in the room. Does it not seem to indicate that wax has an aroma of its own? Why, a bee-keeper once asked what we put into our wax to make it smell so nice. Nothing at all. I don't suppose that our wax smells any better than the wax of any other foundation-maker. Another point: If honey be stored in a pine barrel, it will absorb some

of the piny flavor of the wood. Now, why would not honey absorb a flavor from wax if allowed to stand long enough in it? And again: There are a good many people who prefer comb to extracted. If this were confined to the *consumer* who knew nothing about bee-keeping, we would assume that this preference was based on the supposed purity of the honey in the comb as against that free from the comb. But how do you account for this same preference on the part of many bee-keepers who, while acknowledging the purity of either, prefer section honey? I know you may say there are a good many who prefer extracted; but do you *know* that this number do so for any other reason than for *convenience in eating?* Only yesterday I was eating a nice sample of comb honey and one of extracted, both clover, but it seemed to me the comb had the better flavor. You may argue that it may have been left on the hive longer. But I do not think that will explain it.—ED.]

LARGE HIVES.

Comparison of Wintering in Large and in Small Hives; Depth of Frames an Important Feature.

BY C. P. DADANT.

In the consideration of this question I trust the reader will not lose sight of the fact that, when I speak of small hives, I include as such both the eight and ten frame Langstroth, and that, although I much prefer the ten-frame hive to the eight-frame, I still consider it as too small. When I speak of large hives I mean deep-frame hives, either of the length of the Langstroth or of the length of the Quinby, which is the style we use. The greatest advantage, in my mind, resides in the depth of the frame. The Quinby frame has a depth of 11½ inches, and is, therefore, over two inches deeper than the regular Langstroth. This frame is not a new pattern. It was used and recommended by Quinby long before the invention of the honey-extractor; and some of his largest crops, when leading apiarists were few and honey was scarce. were harvested in this style of hive. A number of Eastern apiarists, large producers, use it yet, and it is quite probable that, if it had been patented and advertised as was the Langstroth pattern, it would still be the leading hive. But Mr. Langstroth held that the Quinby invention was an infringement, as perhaps it was, for I am no judge in such matters, and the fear of infringement certainly deterred many an apiarist from using it.

If I did not have my own experience to guide me I could still perceive that a number of our leading men recognize tacitly that the Langstroth frame is too shallow, and the hive inadequate for a prolific queen, since so many men report favorably on the use of a double story, although they all recognize that such an addition makes the brood-apartment too large for the raising of comb honey. But the purpose of this rticle is to show you, from facts and reasoning, that the deeper frame and larger hive are better for wintering, and so I will pass to this subject.

The facts I base myself upon are those that we have seen under our own eyes, of the better success for winter of the large deep hive. I believe I showed you plainly, in a previous article, why the colony might be more populous, from the greater amount of space, the greater quantity of stores, and the greater ease that the queen has in finding empty cells, in the larger circle which is furnished to her on a greater circumference in each comb, so that she has to spend less time in hunting for cells. We thus have stronger colonies for winter, which is in itself a great advantage, as the number of bees has much to do with their ability to keep warm, and their ability to retain the heat has also much to do with their honey consumption. A weak colony suffers from the cold, and is compelled to eat more. The bowels of the bees are then more quickly loaded with excrement, and their restlessness is increased. Perhaps these differences between one colony and another are very slight; but it is in little things the success of the bee-keeper resides. Was it not Heddon who said, "This business of ours is a business of details"? Yes, it is a "business of details," and those details make the failure or the success. That is surely why the careful, solicitous, attentive apiarist, who can not bear to see a thing out of place in his apiary, and must have every thing "just so," is the successful bee-keeper.

But to me the greatest advantage of the deep large frame is in the greater ease the bees have in reaching the honey and in keeping in a more compact cluster. With a deep frame, as much honey and as many bees can be conveniently located in six combs as in eight combs of a shallower frame, and there is less danger of their chilling, and very much less of their starving. I know that many of our good writers say that the bees can and do move as readily sidewise as upward to the honey in very cold weather; but I can not agree to it, for I have, in practice, often seen the reverse of this assertion. We must not take, as an instance, an ordinary winter, when all the bees come through without trouble. It is the hard and destructive winter that should be used as a criterion, and I have often seen cases of starvation with honey on the same comb, but at the back end, where it was too cold for the bees to reach it. The deeper frame, of the same length as the Langstroth, has more honey above the bees, and as much at the rear, or perhaps also more, at the rear of each comb, than in the Langstroth frame.

If the bees winter better they are better able, in spring, to stand the variations of the atmosphere; there is less spring dwindling, brood is reared earlier, and our colonies are better able to — let me quote Hutchinson —

"raise all the bees possible before the opening of the main honey harvest. We must have the workers, or the harvest will be in vain."—*Review*, page 179.

Another thing: In your small hives you talk of dummies (division-boards as we call them), but very few use them, because the hive is already so small that a swarm is hardly safe that does not occupy most of its combs in winter. In a large hive we have a special use for the division-board, and do not consider a hive complete without one, and that is why we make an eleven-frame hive, one space being occupied by the board. When winter comes, if we have colonies that are no stronger than yours, and can occupy only six or eight of those large frames, we simply remove the remainder and move up the board. Then this empty space is filled with leaves (we use forest-leaves, but other warmth-giving materials are equally good), and we increase our chances of success by all the additional shelter that this filled space is furnishing on the stormy side, which, with us, is always on the west; for we take good care to have the cluster moved over if needed, so as to have the shelter on the proper side. Perhaps you will think this a small matter; but remember Heddon's "it's a business of details," and so it is; and it's always a comfort to me to get a portion of the arguments from "the other side."

In my next I will make a comparison of one large hive versus one two-story hive. Dr. Miller's plan is certainly good, but I like mine better.

Hamilton, Ill.

C. J. H. GRAVENHORST.

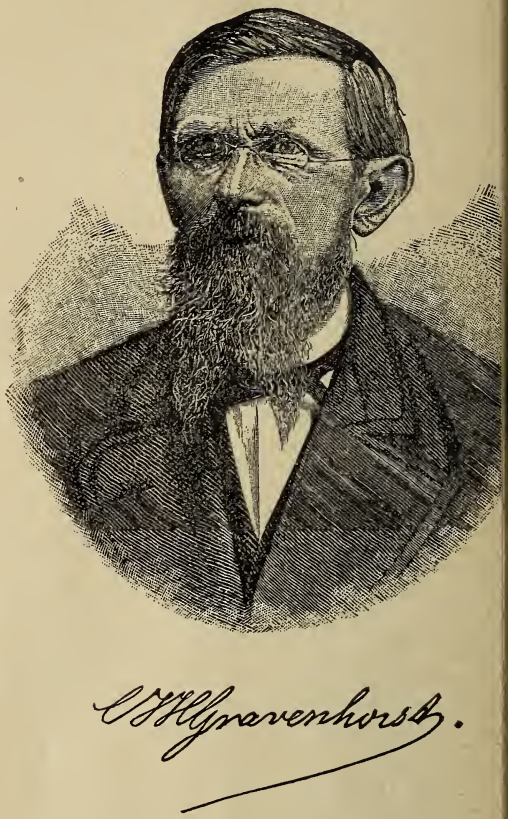
A Short Sketch of His Career as a Bee-keeper.

BY DR. C. C. MILLER.

The news of the death of Gravenhorst came as a shock. It seemed like the bereavement of a personal friend who brought Germany very close to America. True, he had been prostrated for a long time, and at his advanced age it was hardly to be expected that activity could be prolonged for many years; still, the wish being father to the thought, one could not help hoping and expecting him to be once more at the fore with all his wonted activity. And what an activity that was! Gravenhorst was one of the men whom years do not make old. Up to the last his writings showed the vigor of youth. His clear views, drawn from his many years of practice, observation, and reading, showed him to be a master in his profession, and the kind heart that always shone through all he said made every one glad to assign him the eminence he so honestly held.

Christof Johann Heinrich (Christopher John Henry) Gravenhorst was born Sept. 26, 1823. He fitted for the profession of teaching (a profession from which the ranks of bee-keepers in Germany are largely recruited), and began teaching in 1848 at Wispenstein; then, after teaching in Seesen, he obtained a permanent position in Braunschweig. Here he was married, in 1855, to Francisca Bielitz, with whom he lived happily, one son and two daughters being born to them. The daughter Francisca is a practical bee-keeper whose graceful writings have occasionally appeared in print.

Growing deafness obliged him, in 1857, to abandon his profession as teacher, and he then adopted bee-keeping as his sole occupation for the remaining forty years of his life. He was a pupil of Dzierzon, and through his bees not only supported his family but accumulated sufficient to purchase an estate in Braunschweig. Having worked unceasingly with straw hives, and knowing well their advan-



tages, he conceived the idea of retaining all their advantages, so far as possible, and at the same time providing them with movable combs. After many trials and failures, his hive, the "bogenstuelper," resulted (*bogen*, because the tops of the frames are bow-shaped; *stuelper*, because the hive is turned up when opened). This hive is described in a previous volume of GLEANINGS by Gravenhorst himself. If the invention of this hive were the only work of his life, it would give him undying fame. Although little known in this country it is highly prized and largely used by great numbers across the sea. He spent many happy years in Braunschweig, his apiary paying well; but an unhappy lawsuit with a hostile neighbor decided him to leave

there and settle on an estate near Gloewen. Guileless himself, he was not on the watch for guile in others; and a snare in the terms of purchase of his property was so skillfully arranged that he lost all.

Undaunted by misfortunes he courageously commenced again the struggle, settling in Wilsnack, where fortune smiled upon him; his apiary flourished; slowly but surely he retrieved his lost fortunes, and left to his family a magnificent property. Long years were spent by him in Wilsnack, beloved and honored by all about him, till the weakness of age laid him upon a bed of sickness from which he never arose. On the morning of Sunday, Aug. 21, 1898, surrounded by his loved ones, peacefully and painlessly he slept away this life to awaken in the life beyond.

His hive, his beautifully written text-book on bee-keeping, "Der praktische Imker," not to mention other works, and his bee-journal, *Deutsche illustrierte Bienenzeitung*, founded by him and conducted by him for the past fifteen years, are monuments that hardly sufficiently show the high place he holds in the hearts of those who knew him best.

Ruhe sanft, edler Freund.

Marengo, Ill.

SOURED HONEY AND ITS USE.

Honey Vinegar, etc.

BY FR. GREINER.

It would seem that, during such a poor season as the one just past, when the greater part of our colonies were three months in storing only 20 or 25 pounds of honey in sections, the bees would have had ample time to extract all the superfluous water from the raw nectar before sealing it; or in case the condensing or ripening process should be simply a process of evaporation (on this point the minds of bee-keepers, I think, are still at variance), then it would seem there had been plenty of time for any honey to become thick enough to keep indefinitely.

But things did not work that way, and I do not know that any one knows just why. It so happens that we have more soured honey now than I have ever noticed before in one season. There were many sections that had been at one time during the summer all sealed and finished nicely; but as the contents of some of the cells had begun to ferment, and as it had burst the cappings, allowing a part of the honey to ooze out, the bees had uncapped such cells, removed the honey, cleaned out the cells, and, later, filled them up again—in most cases, however, without finishing or sealing them. In some cases the mischief would be on only one side of a comb; then, again, on both, the open and the sealed cells being intermingled, often at the rate of one to three.

When taking section honey out of the supers to crate for market I came across some sections lately that contained soured honey in blotches, with cappings raised half-globe fashion, and the honey partly oozed out, such blotches covering one-half to two-thirds of the whole surface. Of course, all such honey is fit neither for market nor for the table, nor is it suitable to feed to the bees at this season of the year.

Not long ago I saw it stated somewhere that sealed honey, if kept in the hive till late, would continue to improve or ripen — that is, lose a part of its moisture. I know not how true this is; but with this idea in mind I placed quite a number of sections containing soured honey into a super along with some unfinished sections, all to be returned to a colony of bees that was being fed constantly and abundantly for the purpose of getting unfinished sections finished up. This was after the honey season was over with us, or during the month of September. The room in which the colony that was expected to do this work stood was kept very warm during all the time the experiment lasted — yes, even weeks before, during the buckwheat-honey flow. My aim was to have the temperature never go any lower than 80°, and from that up to 95. I succeeded in this quite well; but when I made an examination two weeks later my soured honey was soured honey still, except where it had been removed by the bees and replaced by honey from the feeder. The experiment turned out just as I expected. There is no use in trying to improve soured honey.

But what can we do with it? that is the question. Mr. C. N. White, of England, who, in the *Amer. Bee Journal*, gave not long ago a series of interesting articles on the management of bees, etc., advises, in the Aug. 25th issue of that journal, to "throw away" such honey. I do not fully understand what he means by that. I am not in the habit of throwing away any thing that can be made use of. I claim that I can get just as much out of the soured honey as I am able to get for the unimpaired product. The explanation is easy enough. The soured honey is already on the road to making vinegar, and so I just let it go on that way. As vinegar it will bring me 15 cents per pound (the outlet, however, is only a limited one); and what soured honey I have we can easily work off that way. One pound of honey is sufficient to make a gallon of vinegar by diluting it with water to that extent, and then giving it time.

There are a few people in my vicinity who have an idea (perhaps preconceived) that honey vinegar is not as good as cider vinegar. Some one even claimed it would not keep pickles. But these people know but little about the matter. I have no idea they ever tested genuine honey vinegar. I say, honey vinegar is all right; and still I do not use honey alone, but take half cider and half honey-water. It does not matter much about the exact formula. Should I be short of suitable honey I splice out with maple sap somewhat sweetened with honey. Section honey containing pollen answers nicely for this. I am not sure but the pollen is a valuable adjunct to the honey vinegar. It sets the mixture to fermenting sooner, and is more lasting, and that is what we want.

For years I have managed somehow to keep a few barrels of vinegar on hand, and a few

more "making." Of course, it involves the expense of buying barrels. A good cask holding 52 gallons may be bought for $1.00 or $1.25; a gasoline-barrel for 75 cents. Either will answer; and, when once purchased (and taken care of), will last many years; so this expense is not so very great after all.

I have now quite a trade started in vinegar. It is known for miles around that I keep it for sale, and at this season of the year few days pass by without our selling some.

I want to mention a peculiar fact connected with my vinegar trade. My best customers are people who make the most cider. But it never keeps long enough with them to make vinegar. The barrels leak (probably through the faucet). We make cider in years only when apples are low in price. Two years ago we put in a good supply, and now I keep diluting it with honey-water, as I have the honey.

In regard to converting cider or honey-water into vinegar, I want to make mention of the well-known fact that the barrels with their contents should be kept in a moderately warm place in order to hurry up the process, for if kept in a cool cellar it may take from two to three years before the vinegar-point is reached.

Naples, N. Y., Oct. 22.

SOUR HONEY.

Is it Due to a Natural Acid in Honey-plants? An Interesting Article Regarding the Properties of Honey in General.

BY E. S. ARWINE.

Concerning that sour-honey discussion appearing in GLEANINGS for Aug. 15th, I would say that, in my opinion, the acid was a normal constituent of the honey, and it had not fermented, and could not (if granulated) unless water had been added. Honey weighing eleven or more pounds to the gallon contains too much saccharine matter to ferment. Of this you can easily convince yourself by adding water to reduce it to eleven pounds, and stirring it thoroughly, so as to produce a uniform mixture. If not thoroughly mixed, the lighter sweetened water will rise to the top, and that might sour; and I would remark that honey whose density has been reduced by adding water will ferment a little quicker than nectar of like density when extracted. Here we should make a distinction. Honey will not sour, but nectar will. Molasses will not sour, but sweet water will; and as we would not think of calling sweet water *molasses*, nei-

A GENERAL INTERIOR VIEW OF THE APICULTURAL BUILDING AT OMAHA.—SEE EDITORIAL.

ther should we think of calling nectar, that is thin enough to sour, *honey*.

When I first began extracting, about 1878, I frequently extracted honey that weighed only 10½ to 11 lbs. per gallon, and I never had any sour, although I frequently keep it from one to several months. Again, I would point out that, when nectar has been extracted and fermentation begins in it, its tendency to granulate is arrested. Souring honey (nectar) can not granulate, or else my observation is all at fault; wherefore I conclude that honey that granulates is always pure unless sugar or glucose has been added to nectar. I have made no experiment in the line of mixing, so I can not say at what density crystallization begins.

Mr. Clayton's believing he could have had a dozen sources of flavor assigned to that honey shows how extraneous circumstances help to form guesswork opinions, and how little reliance can be placed on such opinions. Whether or not that particular lot of honey derived its acidity from citrus flowers is guesswork; but here is one thing I do know. There is a tiny vining plant, in habit somewhat resembling the wild peavine, that produces acid honey approximating a mild tartaric-acid flavor, but always decidedly acid; and it is about as good honey as any man ever smacked his lips over, if he does not object to a pleasant sour mingled with his sweet, which reminds me of something I read in a paper in 1852:

MARRIED.—On the 21st inst., Mr. Ebenezer Sweet to Miss Jane Lemon.

How beautifully extremes do meet
In Jane and Ebenezer!
She's no longer sour, but Sweet,
And he's a Lemon squeezer.

I will venture this guess, that that honey was sour when extracted, and could increase in sourness only by concentration of its acid by evaporating its watery parts. Its granulation proved it to be too pure to ferment.

I have no doubt that, had they searched the field where that honey was produced, they would have found a small vining plant, with a red or reddish stem, small oval leaves, and a tiny white flower on which the bees were busy while that honey was being stored. This is the source of the acid in that honey; and as the honey was not uniform in color, so the bees got honey from other sources at the same time they were storing from this little vine, which, I believe, yielded all the acid. This vine seems to yield honey nearly every year; but if there is plenty of honey from other sources the bees neglect it entirely.

Three years out of nine since I have kept bees in this (San Luis Obispo) county the honey gathered from about April 25 to May 20 was perceptibly acid. Two of these years the sage failed, and was very slim the other. This vine blooms from April 20 to July, but was always abandoned when the barberry began to yield freely, about May 20 to 25. The sour honey from this vine is water-white, and it weighs about 11¼ lbs. per gallon. It failed to yield honey this year. Barberry honey weighs 11½ to 11¾ lbs. to a gallon; and I have never seen it granulated when pure. The barberry has not failed in nine years. This dry year was the shortest, and yet we took 850 lbs. from 80 colonies, and left plenty for winter stores. This year the tarweed is a flat failure—the only one in nine years. We usually depend on it for winter stores after extracting two or three times.

Dove, Cal., Aug. 27.

APICULTURAL LITERATURE.

Slang or Humorous Expressions.

BY DR. C. C. MILLER.

From *Bee-keepers' Review*, p. 280, I quote the following, written by Hon. R. L. Taylor, in the Department of Criticism:

"Dr. Miller justifies the use of the class of words to which I object because 'a good many like it.' The multitude likes it. The more's the pity. What we like is easy. We are prone to it as the sparks to fly upward. *Facilis decensus Averni*. The ease of it is the evil of it.

"The language of the masses is rotten with it. Its breeding-place is in the dens of thieves, and in the holes reeking with the fumes of alcohol and tobacco. Its appearance in print is an echo from such places. To our youth it is more familiar than their mother-tongue. Even our educated youth can hardly utter a sentence without introducing it. Can citizens, especially can parents, look upon such a condition of things, and encourage its continuance by using the same expressions in public print?"

I suppose what called forth the first sentence in the quotation was a Straw in GLEANINGS, page 609, in which I said, "R. L. Taylor, the *Review* critic, doesn't like the way the editor of GLEANINGS talks when in playful mood. A good many like it. I rather like to say 'sass' and some other things playfully." The class of words that I justified because "a good many like it" was "sass" and some other words used playfully, the plain inference being that "sass" was a fair representative of the class. Equally plain is the inference that this is the class of words to which I object, because "a good many like it." If what Mr. Taylor says in the second paragraph of the quotation is true, I am doing a terrible thing to justify the use of any such language, and should earnestly devote the remainder of my life to help undo the mischief already done.

He says, "The language of the masses is rotten with it." The word "sass" was originally the vulgar form of the word "sauce," that is, as used by the uneducated masses. Less frequently used in that way now, it has come to be classed as a humorous word, and as such I justify its use. A little more humor at the right time and in the right place will do no hurt. To say that language is made rotten by the use of humorous words is a stronger statement than the truth will warrant.

Mr. Taylor says: "Its breeding-place is in the dens of thieves and in the holes reeking with the fumes of alcohol and tobacco." Is it possible that Mr. Taylor thinks that "sass"

and the two other words that he mentions, "scrooch" and "smoled" (which I think should be "smole"), had their origin in any such place? If I am not greatly mistaken, the word "sass" had its origin in the homes of our New England ancestors—homes, albeit peopled by an illiterate folk, yet as clean and pure as any homes the blessing of God ever smiled upon. No worse charge can probably be laid to the word "scrooch" than that it is illiterate. Mr. Taylor can not conceive how it can convey any other meaning than is conveyed by "crouch." To me it conveys a little different and a stronger meaning than "crouch." That is merely an admission of illiteracy on my part, because I am more familiar with "scrooch" than "crouch" in every-day conversation. I do not justify Mr. Root in using it as a correct word in GLEANINGS. He should use the correct word, so that his readers would learn, if they have not already learned, to attach to the word "crouch" all the meaning they now give to "scrooch." But because it should be cast out on account of incorrectness, it does not follow that it is right to slander it as to the place of its birth.

"Smole" bears upon it the marks of having originated, not in the bad places Mr. Taylor mentions, but among cultured people who could see the comical side of applying to verbs not coming regularly in the list, the rule to change the "i" of the present to "o" in the past, as ride, rode; write, wrote.

More likely than that either of these words had its origin in a den of thieves or in a saloon is it that the word "mugwump," to which Mr. Taylor says he makes no objection, had its origin in some such place, for it was at first used opprobriously by politicians as a name for good and true men who felt they had a right to vote outside of the strict party ticket.

I do not yield to Mr. Taylor in my admiration for correct, choice language. I enjoy reading it, and, so far as I have the ability, try to write it. But I do not find what Mr. Taylor says is true in my case when he says, "What we like is easy." I do not find it easy to write pure English that satisfies me.

At the same time, I do not believe that it detracts from good English to use at times humorous expressions, and to drop into familiar style. "A good many like it," among them those refined in taste and pure in thought, who perhaps could not, if they would, echo the vile language of the places Mr. Taylor accredits as the birthplace of the class of words whose use I justify.

Mr. Taylor's arraignment is entirely too severe. He could hardly be more severe if he were speaking of slang or obscene language. At one time, when I said something about Mr. Taylor's being somewhat given to scolding, he wanted me to cite a case. As an instance, I recommend to him the second paragraph of the quotation I have made from him at the beginning of this article: "The language of the masses is rotten," etc. If that isn't scolding, and severe scolding at that, then I have no correct idea as to what scolding is. Mr. Taylor should remember that one can catch more flies with honey than with vinegar.

Asked why he singles out GLEANINGS, Mr. Taylor replies in substance that he finds errors more plentiful there than in the other journals. Can it be possible that Mr. Taylor thought what he was saying? GLEANINGS is not as near perfection as it should be, but I feel sure there are several others in which Mr. Taylor would find more plentiful picking; and if he so desires I will privately name to him another bee-journal which I think he will find contains on a single page more glaring errors than he will find on any 100 consecutive pages of GLEANINGS.

In reply to the question why he neglects to criticise the *Review*, Mr. Taylor says, "Well, Editors Root and York attend to that thoroughly, and sooner than I am able to get into print." If these two gentlemen have made a business of criticising the *Review*, I think it has escaped the attention of their readers. *Review* is a good journal, and ably edited; but I venture to say that if Mr. Taylor will look through it with the same desire to find errors with which he scans GLEANINGS, he will find for every error mentioned by Editors York and Root nine others left to the tender mercies of the *Review* critic.

I think—and the thought is strengthened by what I have heard other bee-keepers say—that one who knows nothing about Mr. Taylor except what he knows from reading his department of criticism will we likely to think of him as a man keen to find fault in others, and anxious to hold his victim up to public gaze in such a way as to give the most pain possible. Let us hope that he will mend his ways, and show himself in his true colors as a man full of the milk of human kindness, being a critic in the better sense of the word, and keeping always in mind the injunction of the couplet that heads his department:

Blame where you must, be candid where you can,
And be each critic the Good-natured Man."

Marengo, Ill., Oct. 1, 1898.

DRAWN FOUNDATION, AGAIN.

Tested in Convention, but no Gob.

BY L. STACHELHAUSEN.

In GLEANINGS for July 15 you published my letter concerning the new foundation. On the 17th and 18th of August the South Texas Bee-keepers' Association had its annual convention in Floresville. At this convention I showed to the members two sections of honey in which this drawn foundation was used. A large number of bee-keepers tested the honey, and nobody could perceive any difference between this artificial and the natural comb. Nobody could detect any fishbone nor any thing like it. This is of more value, as some bee-keepers had an unfavorable opinion of the drawn foundation. So we see it is a success in this respect too. Now a few words about the advantage of this foundation :

If we uncap a frame with sealed honey, extract it, and give it to a strong colony (that is,

in summer time, and when no honey at all is coming in), we shall observe that the bees will at once occupy it and clean out the honey. The cell-walls will be gnawed off more or less; and the same wax, after it is chewed by the bees, is set on the edges of the cells, and is formed to a rim, which strengthens the cells and gives material for a further prolongation of the cells. If the same colony will get a frame with a full sheet of foundation, this foundation will not be touched by the bees at all. Whenever we give an empty comb without this rim on the edge of the cell, the bees try at once to form such a rim; and I am of the opinion that this is the main reason why drawn combs can be used as bait in the sections. When the bees have commenced to work on a comb they will continue to do so, and will fill the cells with honey when circumstances are favorable. If we use drawn combs for bait it is better to remove the rim. If this is so, the advantage of the new foundation compared with the old common foundation is that the new kind has side walls *without* this rim, while the old foundation has this rim without the side walls.

It is somewhat difficult to observe the way in which bees build new combs or draw out foundation. The bees are then so close together that we hardly see or distinguish the motion of a single one. I once happened to observe a few bees working out foundation in a section when we had about 100° in the shade, and I believe this to be the only condition in which this observation can be made.

We can observe that the rim of a cell always has a round appearance like foundation with the so-called round cells. The bees start the cells round, and they become six-sided by later manipulations. As soon as the cell needs a further prolongation the bees draw out this rim by taking it between their mandibles; and, pressing them together, the bee moves its head away from the bottom of the cell, in this way thinning the rim and stretching it out. It is easy to see that, by this manipulation, the cells, at first round, must necessarily become six-sided, because six cells are around one. As soon as this order is lacking, the cells will acquire quite a different form.

To smooth the now drawn-out side wall, some saliva is brushed on the wax, using the point of the tongue as a brush, and then that three-cornered piece of chitin, seen between the mandibles (called tongue-bone) is rubbed along the side wall on both sides. New wax scales are now chewed, and plastered around the edge of the cell, forming the rim again.

In the same way the bees start the midrib of the comb as a straight wall; but they start the side wall as soon as they get the place for it, and, by drawing from both sides, the wax, being a very soft material, is stretched till it is in the shape in which the least material is necessary, and so the well-known pyramidal form of the cell bottom is formed.

It is of great importance to have a correct idea of the way in which the bees build combs. It explains many observations. For instance, some bee-keepers have observed that the flat-bottomed foundation with very thin midrib will show the pyramidal form of the cell-bottom more or less after they are drawn out by the bees (I myself have had no experience with this kind of foundation). If this is so (and I do not doubt it) the question arises why it was not so with the drawn foundation which The A. I. Root Co. made in 1897. This foundation had cells about ¼ inch deep. The bees gnawed off about ⅛ inch of this; but the remaining ⅛ inch had given enough stiffness to the foundation so that the midrib could not give way when the bees were drawing on both sides. It is plain now why the side walls of this foundation near the midrib were not thinned by the bees. I believe that this foundation would have given better satisfaction if the cells had been only ⅛ inch deep or less. It would be interesting if experiments in this line could be made.

So we see it is an improvement that the cells of the new foundation are ⅛ inch deep only. When the cell walls can not be made of natural thickness they should not be deeper, as the bees will gnaw them off, to remodel them to the rim and draw them out anew — that is, if the foundation is to be used for sections.

Another question is, "Can we manufacture and use an artificial comb for extracting or for brood-combs?" It would take too much space to consider this question now.

Cutoff, Tex., Sept. 1.

[We are just preparing a set of plates with shallower walls, having the same delicate base. These plates will turn the article out more rapidly, and come nearer to being a commercial possibility, than those we have formerly made.—ED.]

VISIT AMONG THE BEE-KEEPERS.

In the Willow-herb District.

BY H. R. BOARDMAN.

Continued from page 799.

Upon this burnt land, in many places a honey-flora of considerable importance has sprung up — goldenrod, boneset, asters, and the famous willow-herb with which I was anxious to make a more intimate acquaintance. This kind of vegetation was confined mostly to the swamps and swampy land.

North of the burnt pine belt is a large tract of hard-wood-timber land interspersed with cedar swamps. This tract has not been devastated by the fire except in the swamps. In these have sprung up a great profusion of fall bee-forage. The willow-herb I found here in abundance mixed with the other bloom. Hard maple is the prevailing timber, with basswood, elm, and scattering trees of several other varieties. A profusion of wild red raspberries grows everywhere.

We reached Petoskey in the evening, tired with a long day's ride, and glad to welcome the sight of a comfortable bed, but were up and taking in the sights by the early light of the next morning.

Petoskey is a resort town, notably a hay-fever resort, composed largely of hotels and

supply stores, with Bay View only one mile distant — a Chautauqua Society resort, a city of cottages of great beauty. Both these places are situated upon the sloping hillsides that reach down to the shores of Little Traverse (or Petoskey) Bay, and are thickly interspersed and surrounded with little native pines and other evergreen-trees, especially Bay View, which is almost hidden from sight in places by this profusion of native trees among which the cottages are built.

Petoskey Bay is a beautiful sheet of clear cold water, a mile and a half across, with a railroad and bicyle-path running around to Harbor Springs on the other side. These, with the boating facilities on the bay, furnish excellent facilities for diversion and exercise.

I rode around upon the wheel-path, and was charmed with the beauty that nature had so lavishly bestowed on every hand.

Meeting some small boys I asked, "What is the attraction at Harbor Springs? I say, how much of a place is it?"

"Oh! not much — a store and two apple-trees."

Having learned this much of the place I returned without visiting it.

I was informed that the hay fever is caused by the noted ragweed so common in Ohio and everywhere else except at these northern resorts, where it does not grow. I felt sure I should be able to find a sample of it, but entirely failed after looking very carefully.

I began to feel anxious about the honey and the bee-industry, and commenced visiting the groceries and supply-stores along the main streets. I found honey, but it was not up to my expectations. I could hear of no bee-keepers, except in a small way, among the farmers. Choice honey was mostly shipped in, and prices were high.

I found an old neighbor, with whom I stayed a few days, at Elmira, 25 miles south of Petoskey. It was here I visited my first bee-yard in Michigan. It was on a large farm of 640 acres, devoted to general farming. It is not surprising that the bees should be neglected. I found about 15 colonies arranged upon a bench about a foot from the ground. A good-sized stick of wood was placed upon each hive (I wonder where that idea came from). Here they wintered as well as summered. How is that for winter protection in this cold climate, where the mercury plays peekaboo down into the bulb of the thermometer, sheltered only by a stick of wood, and yet wintering as well as the average progressive bee-keeper winters in Ohio?

By permission of the proprietor I opened a few hives (or, rather, cases on top of the hives) which had not been removed, to see what was being done by the bees. The proprietor, being a discreet man, remained at a distance while I was about this. I must admit that I was disappointed on finding no signs of recent honey-gathering sufficient to induce comb-building — not even to show in whitening the combs. With all of the profusion of bloom which I had seen, and the willow-herb too, I felt sure I should find the bees doing good work. I was disappointed. The raspberry and hard maple would furnish a great amount of honey, but it comes so early in the season that the bees do not get built up strong enough to gather it.

Elmira is situated on an eminence — the highest, I was told, in the southern peninsula of Michigan. From here the streams run to every point of the compass. The Boyne River rises a mile and a half to the north, and runs along the line of the railroad, which winds around among the hills down a steep grade for nine miles to Boyne Falls. The streams and lakes here are clear and cold, and are well supplied with speckled trout and other fish—a fact of which I had the most ample and satisfactory proof, for I spent a day in the realization of my most ardent boyish dreams in capturing the speckled beauties in the Boyne, and then the breakfast next morning—oh! oh! The water in the stream where we fished had a temperature, by actual test, of 49° and was excellent to drink.

The potato crop, which is the important crop here, is an entire failure; same with corn; wheat badly damaged, the result of a severe frost on the 10th of July. Fruit is plentiful, and of good quality, especially apples. So I said to myself, as I cast a retrospective glance over the last season, other industries are attended with uncertainty as well as bee-keeping. Even farming is not always sure.

I cast a lingering glance backward from the moving train as I resumed my journey southward, followed by many pleasant recollections of my short stay; and the pleasant picture of Elmira, surrounded by its evergreen-wooded hills, was gone.

I looked out on both sides of the cars for a glimpse of some bee-yard, and was rewarded by seeing a good-sized well-arranged apiary with a man in the midst of the hives, with a smoker in his hand, puffing away vigorously. This was refreshing. It was just north of Manton, and was the only bee-yard I saw during the day's ride. This did not impress me that this part of the country was overstocked with bees.

I had decided to abandon my excursion-pass at Owosso, and make this a sort of headquarters from which to make short visiting excursions into the surrounding country. I reached Owosso at evening in time to drop W. Z. Hutchinson a card to look for me next day, and then wheeled out into the suburbs to make the acquaintance of a young German bee-keeper. He keeps a fair-sized apiary, and deals in supplies. He produces comb honey without separators; sells in his home market almost entirely, gets a good price, and has his cases returned.

I sampled his honey, which showed a little honey-dew.

"To whom do you sell so many supplies?" I asked him. He said, "There are a great many small bee-keepers scattered all over the surrounding country among the farmers."

The next morning I wheeled toward Flint, running out on a fine wheel-path for 3½ miles. I passed several shafts where they were mining coal, and met several teams with coal.

The roads were good, the wind at my back, but the weather was very hot.

East Townsend, O.

RAMBLE 155.

A Bee-keepers' Paradise.

BY RAMBLER.

When Pizarro landed upon the Isthmus of Darien he faced a turbulent band of followers; and in order to pacify them he drew a line upon the sand with his sword, and said, "On this side is Panama and beggary; on this, Peru and gold; which will you choose?" Every one chose Peru and gold.

Judge Levering, lest February, acted as my Pizarro; and, drawing a line upon the streets of Los Angeles with his cane, he said, as he pointed north, "This way leads to the alfalfa-fields of the northern portion of the State, and to honey and prosperity; this," pointing south, "leads to the starvation of bees and to the poverty of the bee-keeper."

Figuratively speaking I was in the condition of the Blasted Hopes bee-keeper so often illustrated in GLEANINGS, and was glad for this ray of encouragement. My friend added several more rays of hope and encouragement by inviting me to go north and aid him in the care of 265 colonies of bees that belonged to the estate of his brother, recently deceased, and of which he was the administrator.

Mr. Levering left for the scene of operations early in March. It did not take many minutes to decide to follow him; and my first duty thereafter was to put my own bees in condition to withstand the hardships of a dry season. They had ample stores to last them for many months, and to enable them to husband said stores I ordered Tinker zinc from The A. I. Root Co., and constructed enough queen-excluding honey-boards for all of the colonies. I made the wood-zinc board, for they are infinitely better, and more durable than a plain zinc, for they do not get out of shape and into innumerable twists.

I knew that my bees would be so enterprising as to rear a large amount of brood upon the stores already in the hives; in fact, they were already at it, and had a good amount of brood in the latter part of March, and hives well filled with bees. As fast as the honey-boards were prepared I confined the queens to one shallow story of the Heddon hive; and, with plenty of honey and a restricted brood-nest, I felt it safe to leave the bees alone for several months in Durfee Canyon.

Early in April I received a letter from Mr. Levering, wherein he gave a glowing description of the country, and he closed his letter with the following refreshing sentence: "It is now raining; let her rip." It had been so long since I had seen even the indications of rain that I was in haste to get to the north.

Although in a hurry to get north I thought it best to drop all thoughts of bee culture, and spend one day with an old friend and fellow-townsman, one of my old schoolmates—yes, two of them, for his wife was a fellow-townsgirl too, and we all went to school together. It had been nearly twenty years since I had last met Theodore Reynolds and his wife Jane; and, learning that they lived in Dos Palos, a town directly on my route, it would take a hard-hearted person indeed to pass them by, and I dropped off the train a little past midnight on April 6th. Dos Palos is on the West Side S. P. R. R., in Merced Co., and about half way between Los Angeles and San Francisco, or 150 miles from the latter, and in the great San Joaquin Valley. In passing from the depot to the only hotel, the moonlight view of the town was not flattering. There were but few houses, the country looked dry and poor, and I mentally pitied friend Theodore for living in such a place. When I entered the hotel the only live occupant was a kerosene-lamp. It flickered a sort of welcome as I closed the door, and, finding nothing else to amuse myself with, I rapped on the table.

"Hello! who's there?" came in a dreamland voice from an inner room.

"It's myself," said I, "and I want a bed."

"Have you matches?" said the dreamland voice.

"I have," said I.

"Then," said the voice, "take yourself up stairs, find room No. 12, and go to bed."

"Shall I register on the table here?" said I.

"Register be h-a-n-g-e-d!" and my invisible voice had drifted back to dreamland.

My morning impressions of Dos Palos were not so favorable as the moonlight impression, and again I had a pitying feeling for my old neighbor and friend. After the hotel man had finished dealing out drinks at the bar (not to the Rambler, mind you) I inquired

for the whereabouts of Mr. Theodore Reynolds.

"Oh, yes!" said the man; "Mr. Reynolds lives over in the colony;" and, pointing across the plain, called my attention to a long stretch of green trees extending miles up and down. "You see that red roofed building through the trees? That is a new schoolhouse. Mr. Reynolds lives near it. It is two miles out there."

Those green trees gave me assurance that I should find my friend in better circumstances than I had feared, and I trudged over the two miles with a lighter heart. Before I had covered the two miles I knew that good people lived there, for every one, old or young, had a bow and a smile for the stranger who was approaching their town. It was an agreeable change from what I had been used to in Los Angeles, where every one rushes past you as though you were of no more account than a hitching-post.

Here by the schoolhouse I met my last man, who pointed out the residence of my old friend. It was embowered in fruit and other trees, and flowers filled the ample space in front of the house; all betokened prosperity. I confess that my heart beat a little faster as I approached.

Twenty years and their changes! would they know me? and were they their former good selves? "Yes," I almost shouted, as a woman came to the door. "That is Jane, just as natural as ever; and her first exclamation, "Why, Johnnie Rambler, as I live! how do you do?" Then Theodore came limping from an inner room. He too gave me a cordial greeting. He had several twists of rheumatism corked up in his leg, but it did not diminish the old friendship a particle. We all got aboard a train of conversation that night, and did not get off and to bed until after midnight.

Mr. Reynolds came out here from Nebraska some seven years ago with a company of people from that State, to found this colony. I did not expect to find any thing of interest to bee-keepers here, so was agreeably surprised to find that I had stumbled into quite a good bee locality, and that my friend had quite an apiary. He had been interested in bees about as long as I had; in fact, we once bought all the bees a neighbor had, away back in New York, and divided them between us. That was years ago; but the memory of it still lingered, and here he was again dabbling with bees.

I asked my friend how many colonies he had, and he guessed he had about sixty. "But," said he, "I'll count them to be sure."

Out through the peach-orchard, along the irrigating-ditch, back of the hen-house, and in various other places, and he reported that he guessed there were sixty-five of them. I concluded that my friend had too many irons in the fire, as the old saying has it, and was allowing the bee-iron to burn, and he agreed with me, and then and there he made me such an offer on a bee-trade that I was sorry I had agreed to go further north; but my promise was made, and north I must go. At my visit in the first week in April the bees were swarming, and all new swarms were being put into new Dovetailed hives, and I had the pleasure of helping hive a few swarms, and to show my friend how to transfer colonies from box hives. I am quite sure that he will work into a first-class bee-keeper if he devotes more time to his bees and less to his ranch. When he came to the colony he performed just as they do in Nebraska — wanted land, and bought forty acres. Owing to the fertility of soil here, that was twenty acres too much, and the care of it keeps the family busy all the time.

The most extensive bee-keeper in the colony is Mr. Burr Ray, who has an apiary of 200 colonies. In 1897 he produced from 160 colonies 12 tons of honey. I found his apiary not a particle more orderly than many I had seen in the southern portion of the State; but he gets a good crop of honey every year. Instead of sending it to commission houses, he spends several months on the road, and disposes of his honey to all who are disposed to be sweetened. In this way he gets a fair price for his honey

Bee-keepers further south had heard of this little paradise, and the Flory Bros. had moved a large apiary to within two miles of Mr. Ray. I do not know whether Mr. Ray was at all anxious about it or not; but it would be no more than human for him to look a little jealously that way sometimes. There are a few other bee-keepers in the colony, and I have no doubt their apiaries will grow, and the field be well stocked.

Mr. Steele, a near neighbor of my friend, had a small apiary, and I was pleased to note that he had the bees in Heddon hives. He brought them with the bees all the way from Nebraska; but in his case, as well as with friend Reynolds, he had more irons than he could attend to, and the bees were not in that first class condition they should have been.

The source of honey in this colony is alfalfa. There is a great abundance of water for irrigation. It is brought from the San Joaquin River in a large canal 25 miles in length, and the water never fails.

Besides alfalfa there is other honey-producing flora, and my friend pointed out a little white blossom upon a running vine that was locally known as carpet-grass, which produced a fine quality of honey.

The colony contains twelve square miles, and it adjoins the great Miller ranch, which contains the generous area of 180,000 acres.

I was favorably impressed with the prosperity of the colony; and should I mention the extent of the crops of alfalfa and barley that are produced here I fear some of my eastern friends would think I was drawing on my imagination. The leading fruits on my friend's ranch are peaches and prunes; but, besides the above, he was growing apricots, pears, plums, nectarines, apples, grapes, cherries, quinces, oranges, lemons, olives, persimmons, figs, all varieties of berries; and of nuts, the almond, walnuts, and the chestnut. Dos Palos certainly presents many features favorable to the home-seeker.

While my friend was driving me around the colony there was a demonstration that the ladies here are of the energetic order. A young blacksmith had fallen in love with one of the fair maidens, and had induced her to leave the parental roof. The mother was indignant, as she had a right to be, and proceeded to the shop, with a whip, and gave the young man a sound thrashing. The irate woman supplemented her exercise by attending a revival service which was in progress in the church, and taking part in the proceedings.

When I stopped with my friend I had an idea of staying but one day; but two passed before I could get away. The memory of meeting an old friend, and the finding of another bee-keeper's paradise, will linger long in the chambers of the memory.

ABOUT CLOVERS.

Crimson Clover, Alsike Clover, Sweet Clover, Etc.

BY THADDEUS SMITH.

I have been familiar with growing red clover from my youth up. I have raised alsike clover a number of years, and found it quite satisfactory, making a better hay, in my opinion, than red clover, though not so much per acre, and probably not of as great benefit to the land. In sowing clover for hay now I would always mix alsike with it. I have had four years' experience in sowing crimson-clover seed, and, as with hundreds of others, it has been very unsatisfactory. The first year's sowing was a failure to get a stand. The second year was like the first. I sowed at different times and under different circumstances, and yet in these two years I did not see a dozen matured clover-plants. The third year I got a partial stand — very scattering on most of the ground. It was well protected by snow in the winter, and came through all right. When in bloom it was a very pretty sight where thickest. I plowed some of it under, saved some seed from the best, and let the other go. The fourth sowing was made last July in several different places, and as the weather was very favorable I got a good stand. It came through last winter fairly well, some of it being killed where the snow was blown off, and some where the ground was wet; but none of it made any extra good growth.

The puffs given crimson clover in the last few years by newspapers and newspaper correspondents of some of the Eastern States who were raising crimson-clover seed for sale have induced the farmers of the country to spend thousands of dollars for seed that has never brought them one dollar in return. I have a friend in Kentucky — a large farmer in the blue-grass region of that State—who sowed 50 acres at one time in his cornfields, and it was a complete failure. A friend on a neighboring island—one of the most progressive and successful fruit-growers in Ohio — was led to expect great things to result from sowing crimson clover in his orchards and vineyards. He bought seed, and sowed for two or three years; but, failing every time, he gave it up in disgust. Hundreds of others have had the same experience. I have been more persevering than many others, but it has been nothing but an outlay.

A. I. Root succeeds well with crimson clover on his rich, highly manured, thoroughly *underdrained* land, when it is sufficiently covered with snow the coldest weather to keep it from being killed; and others who have been succesful tell us about enriching the land with fertilizers before sowing; and I think that these facts give the key to the principal cause of so many failures. Crimson clover will not succeed on thin or moderately poor land. We usually sow clover to *improve* land — to restore its fertility. I have never worked land that ever got too poor to raise a fair crop of red clover, and that could not be recuperated and brought back to fertility by sowing red clover and a proper rotation of crops, without manuring or using other fertilizers. I now have land that produces better crops than it did forty years ago, that has never been manured.

So far as I can see or learn, crimson clover has no advantage over red or alsike clover as a general farm crop. It is more difficult to get a stand of it. It is more liable to be killed in winter. It does not make as good hay. It is admitted that the hay has proven to be injurious to horses — sometimes kills them. It is no better as a nitrogen-collector or fertilizer. Its main value is as a kind of catch crop, to be sown after the removal of some early crop, on the rich land of the intensive cultivator or gardener, and plowed under the next spring to give more humus and nitrogen to the soil. But may not red clover be plowed under with as good effect? Who has tried sowing red clover in July or August as a catch crop? I sowed some last June, and it is doing well. I know that it does not mature or bloom as early as the crimson; but it may make as much humus and nitrogen. Last spring I had some crimson growing alongside of a piece of red clover, and the crimson was in bloom some ten days before the red, but at the same time the red was from three to four inches the taller, and it would have made a much larger mass of tops and roots to plow under at the time the crimson came into bloom. The seed-sellers have been the only ones who have made the growing of crimson clover very profitable.

Lately I have been watching and experimenting with sweet clover. It is found growing here along the lake shore in the rocks and gravel, as well as upon good soil on the roadsides; and when I read A. I. Root's statement that, in all his travels through the country, he had never seen where sweet clover had spread from the roadsides into adjoining fields and pastures, I was very much surprised; for on a road along the lake shore, only three miles from my house, I had often seen where this clover had extended some distance into a pasture. After reading A. I. R.'s statement I made a special visit to this neighbor to investigate. I found a pasture covered with it for a distance of 100 yards from the road, and it was nearly as tall as my

head (I am over six feet high). I found some growing in his vineyard and in a corn-patch. I asked this neighbor why he had not fed it to his stock, or pastured it. He said he had cut it for his horses, and gave it to them green and as dry hay; that he had turned his cows upon it, but stock would not eat it. I noticed on the road, in front of him, that cattle had been running at large on the road, and had eaten the grass down close to the ground, but the clover was almost untouched. I proposed to this friend that he save the seed and try to make something out of it — that I wanted some seed myself, and that I thought I could find a market for all he could save; he could cut it with his mower, and run it through the wheat-thrasher. He made an attempt to save some seed by cutting it with a scythe, and thrashing by hand, but this, of course, he found hard and slow work, and he quit and brought me only half a bushel of seed, for which I paid him $1.50.

At another neighbor's, only half a mile distant, I saw that sweet clover was spreading into his front dooryard; and last spring I interviewed him, just in the act of mowing it. He said that he was feeding it to his horses in the stable; and as they had been confined all spring without any thing green they ate it quite readily. It was then in its young and tender stage. He had tied his cows out on the roadside in front of him, where they had kept the clover pretty well trimmed down, but he said it would be worth $50 to him if the stuff had never got on his place. This was rather discouraging to one who had been sowing the "stuff" on his place; but I knew that these neighbors had not made any thorough attempt to keep the clover down. My neighbors laugh at me, and say that I can never get rid of it; but I am not alarmed, and intend to experiment a little.

Just after the frost was out of the ground I gathered some of the roots of the three kinds of clover to compare their root systems. I was surprised at the immense roots of the sweet clover, both as to their size and length; for, although I knew before that it had big roots, I had never tried to get the whole root. Were I to say that one root of the sweet clover would weigh from 20 to 25 times as much as one of the crimson, I think I should be in bounds. I estimated that, on an average, the red clover had about twice the weight of roots of the crimson, though I had no means of weighing them accurately. I found the so-called nitrogen-bearing nodules on all the roots, but apparently less upon the sweet than upon the others. I have sent specimens to our Ontario Agricultural College for examination and report of the specialist professor.

I have an idea that this sweet clover, with its tremendous roots and large and early growing tops, may prove to be a very valuable thing to plow under, to furnish humus, nitrogen, and other fertilizers to the soil. We shall see. I expect to plow mine under before it seeds, even before it blooms for the benefit of the bees, and I don't think that I shall have any trouble keeping it within bounds.

Pelee Island, Ont.

[Friend S., I am very glad indeed to get your fair and honest opinion in regard to the clovers; but I think you are a little severe on crimson clover, and on those who have sold the seed. I read over twice all you have to say, to see if you did not somewhere suggest that your failure, and the failure of others you mention, might be because you were too far north. If I am correct, several parties have tried sowing red clover among corn, or where early potatoes came off, exactly as we do the crimson; and, if I am correct, the crimson was not only earlier, but it stood freezing and thawing better. Many of our agricultural editors have cautioned their readers not to expect crimson clover to be a profitable crop further north than, say, the southern part of Ohio. This may be true; yet there are a great many who are succeeding as we are, year after year. Having the ground thoroughly underdrained, and rich in fertility, has much to do with it, no doubt. I can hardly understand why horses and cows should refuse to eat sweet clover. I find cows, wherever I go, eating it greedily whenever they have access to it.

Now, your friend who gave the green clover to his horses before they had had a chance at any other green feed, will find, I think, that these horses ever afterward will take sweet clover before any other kind, and, in fact, almost before any thing else. It is possible the cows you mention would have to be taught something in the same way; but when they once get a liking for it, it will last them for ever. I wish some of you would try keeping cows away from green feed in the spring, until they are hungry for it, and in this manner get them started on sweet clover.

I confess I feel a little impatient with the farmer who says he would give fifty dollars to have the sweet clover off his land, or makes such expressions. Let me say to all such, sweet clover is not a weed, but a *clover*, and one of the most valuable clovers to plow under. What farmer would complain to see a rank growth of red clover on his soil, even if his cows or horses would *not* eat it? Every one who grows crops knows that a heavy growth of clover is worth as much as a good coating of manure, and sometimes more. If it is on the roadsides, then plow up the roadsides, and raise crops of any thing you want. If it is in your fields, plow it under and grow a crop. It surely is not at all difficult to get rid of. It grows on the railroad grounds, close to my potato-patch, year after year. It makes a great rank green growth earlier in the spring than any other crop; and it bears great quantities of seeds that drop right down in my cultivated ground, where I grow potatoes and other things. Lots of weeds of different kinds come up among our potatoes; but sweet clover, never. It is a kind of plant that will not grow where the land is cultivated and stirred as it ought to be for good farming. In this respect it is entirely unlike the most of weeds that trouble farmers. I am glad to know, friend S., that you are getting faith in sweet clover, even if you are not getting it in crimson clover.—A. I. R.]

BEE-FEEDERS AND FEEDING.

Dearth in Southern California more Complete and Prolonged than for Fifty Years; Feeding with the Hill Feeder.

BY J. M. HAMBAUGH.

The sparse showers and light rainfall of the past winter in Southern California have played havoc with the bee-keepers' prospects for the season, and the contemplated financial benefits to be derived from the pursuit have resolved themselves into deferred payments of indefinite promise; and the poor little "busy workers" have long since realized that it is a case of the "survival of the fittest;" and where no attention has been paid to their needs and wants many have long since succumbed to the inevitable, and the wary moth-miller has invaded the precincts, and the once beautiful combs are an unsightly mass of webs, worms, and cocoons. Yes, thousands of colonies of bees have died, and thousands more are bound to die, where judicious feeding has not been practiced; and the prudent and successful bee-keeper is he who is in full sympathy with their poverty, fully realizing their needs, and is armed with the necessary appliances whereby to feed and nourish them through the season of failure from Mother Earth to meet their requirements.

From what we can learn from old Californians, this has been an unusually hard season for the bees in Southern California, the dearth being more complete and prolonged than any during a period of 50 years. This we can not verify from our own experience, as our sojourn is of but three years' duration; but we do realize that it is not all plain sailing to the average honey-producers of this section of the country.

One source of consolation is that no two successive years of failure ever occur, according to the statement of our apiarian predecessors; and, this being the case, with the assurance of a wondrous yield should normal conditions once more come around, it behooves the bee-keepers to see that loss of bees is reduced to the minimum; and now the subject of feeders and feed is the all-important one to the bee-keeper.

In our experience we have always advocated the feeding of pure liquid honey. If the honey should be thick and heavy, dilute it with water slightly, but not sufficiently to make it watery and thin. The cheapest grades are as good as any here in California. In the event that honey can not be had, a syrup can be made of sugar of any grade by mixing water and bringing it to a gradual heat, stirring it meanwhile. The proportion is about two-thirds sugar to one-third water.

As to the subject of feeders, some do not use any of any kind. They simply tilt the hive backward so that the honey will not run out at the entrance, and pour the honey over the combs in limited quantities, and let the bees clean up their house and make their toilet as best they can. We do not advocate this untidy way, realizing from experience that it is not only untidy but a dangerous method where many bees are kept in a body; neither do we believe in outside feeding, as it is a bait and a free fight for all within a radius of three miles, which will not pay the bee-keeper, besides the danger of getting up a wholesale robbing-fever, in the event of which it at times becomes extremely difficult to control, especially for the novice; and the feeder that will obviate this difficulty, and give it to the bees at home, as it is needed, without danger of outside interference, is what the bee-keeper wants. The most satisfactory in our experience has been the Hill feeder, which is made like a fruit-can with a sunken lid perforated with fine holes. You simply fill, or partially fill, one can, according to the strength of the colony, put on the lid, and invert it over the brood-nest. An upper body is, of course, necessary. In the event of having a very populous colony, two or three cans may be used in the same body. Quart cans are preferable.

We have used successfully the Mason self-sealers and tin fruit-cans as feeders, by perforating a piece of tin full of fine holes. Spread first a small piece of gunny sacking over the mouth of the filled can or jar, then place the perforated tin on the sacking; invert over the brood-nest. This is an economical plan; and where the apiary is small it is a very safe and desirable method; but where much feeding is needed, the first-mentioned method is preferable. Care and judgment must at all times be used, and the feeding done late in the afternoon or evening. The cans can be taken from the hives, and refilled under shelter from the bees, and placed back in the hive, with no smell, which is so essential in a bee-yard during a honey-dearth. A neighbor bee-keeper with 300 or 400 colonies feeds at any time during the day, he says, with safety, with the Hill feeder.

Escondido, Cal.

SHADE FOR BEES IN FLORIDA.

Honey Making People Sick.

BY MRS. L. HARRISON.

Mr. Root:—I regret very much my inability to meet with you all at the late reunion of bee-keepers at Omaha; but circumstances beyond my control prevented. However, it's a panacea to hear the talks around the camp-fires, even if it is second hand. I've listened with great interest to the discussions about "honey making people sick," and it rightfully demands a day in court to prove its innocence.

Before we engaged in bee culture, an old farmer friend "tuk up a gum," as he expressed it, and brought it to town to sell. We purchased some of it. We found that, if we ate the least amount of that honey, it invariably was followed by sickness. It was just such honey as is usually obtained from a bee-tree—old black comb, with bee-bread in abundance.

The following spring we purchased two colonies of Italian bees, and put on surplus boxes. Beautiful white-clover honey was the result.

Reading in a bee-paper that honey is an excellent remedy for a cold (and as we were thus afflicted), we procured a large piece of beautiful white-clover honey, and ate it, drinking with it some hot mint tea, and retired, expecting to hear from that honey. We did not, sleeping well all night. From that time until now, more than a score of years, all the family have been eating honey, without the least discomfort. The Creator intended *honey* as food for man, but not bee-bread, or pollen. When a bee-tree is cut down, the pollen, or bee-bread, and honey, are all mixed up together, and that is what makes people sick, and not the bees running over it with tails elevated.

FARMERS WRONGFULLY ACCUSED.

It's a mistaken idea that farmers lower the price of honey. The little they sell does not affect it. It's like the fable of a gnat on the horn of an ox. Last winter the price of honey was fair until a carload was consigned to a commission house from California. This honey was pushed upon the market—had to be sold to get it out of the way. The more a customer would take, the lower the price. Honey had been bringing 12½ cts. per lb. Dealers could then buy it for 8 to 10 cts. per pound. We are never out of honey, good seasons or poor. People know that our honey-house has a supply.

CRAYCRAFT'S BEE-SHED.

I've taken much comfort in looking at the picture of Mr. Craycraft's bee-shed, Astor Park, Florida, as he looks so restful sitting on a stool by his hives, with a chinaberry-tree near him. I should like to take a walk with him between the rows of hives, and then on the outside in the sunshine, any time from November until April or May, and ask him where he felt the best. I never saw a place where there is so much difference in sunshine and shade as in Florida. The rooms on the sunny side of our house are genial and warm, without fire, while on the shady side they would be uncomfortably cool.

While visiting the apiaries of the firm of Alderman & Roberts, the largest in the State, at that time consisting of 1300 colonies, I was walking around one of the apiaries in company with Mr. Roberts, when he said, pointing to a grove of jack-oaks, "When swarms clustered on those trees I hived them, and, being very busy, I left them there. They have done much better than those under the sheds. When I get the ground grubbed out I am going to put more bees there."

I should like to have Mr. Craycraft keep a few colonies in the sunshine during the winter, and note in the spring if they are not more populous than those in the shed.

It would be well for all who care for bees or other animals to put ourselves in their place, and consider in what way we should be most comfortable, and in what way we might accomplish the most work. Bees in Florida work all winter, and rear brood. If they are in the warm sunshine they can work more hours than in the shade. It appears to the writer that under the shade of a scuppernong grapevine would be a good place for bees. A resident remarked that this vine should be named "Good Sense," for it never leaves out until all danger from frost is passed. This vine could be trained to run up so that a person could work comfortably under it, and its nature, is to spread out flat. Colonies would swarm before it leaves out, and then, during hot weather, be in dense shade. The boards of the shed-roofs yield no fruit; but the vines would yield delicious grapes. Thus the ground would be a producer of both honey and fruit.

Peoria, Ill.

SNAP SHOTS.

A Bit of Experience.

BY SIDNEY K. CLAPP.

Mr. Root:—My reading has been wide and varied in apiculture; but, supplemented by GLEANINGS, my experience, and that offered by others, it has become one of real pleasure and profit. I inclose a little group of photos that will show to some extent my interest.

No. 1 shows my experimental apiary containing eleven hives in winter quarters under large fruit-trees, sheltered by a high boxwood hedge to the northwest, giving the hives an exposure to the southeast. Other hives extend right and left.

Photo No. 3 will show the grading of my surplus. The first four boxes to the right I call No. 1, and the four to the left No. 2; and then, again, I might divide each group into two others. I have found it far more profitable to sell only No. 1 at a good price, and distribute gratis the second grade, or use it at home. The two boxes at the left, while capped evenly, contain dark honey, and are travel-stained.

Photo No. 2 shows a type of frames used. One, marked "old method," was made entirely by the bees with no starters (contains 30 per cent of drone comb). The one marked "new method," built at the side of the first, was from a full-wired foundation, and contains not one drone-cell. Both were used for the whole season in the same hive.

Photo No. 4 shows a group of drone and queen traps of my special construction.

On page 888, 1897, Mr. Doolittle speaks of submitting our mites for the good of all. Allow me to suggest a remedy for the fear of burning from a smoker hanging by a hook, as suggested on p. 889. I have found it a great advantage, in more ways than one, to have my smoker-barrel covered with a sheet of asbestos paper; then if, in a hurry, your fingers touch the hot barrel, you do not receive worse than twenty stings in a bad burn, and perhaps upset your plans besides. The asbestos paper is held snugly around the barrel by means of copper wires.

South Boston, Mass.

[We did use asbestos for a couple of years as a lining for a smoker barrel; but later found that a supplementary cylinder or shield with air space was lighter and better.—ED.]

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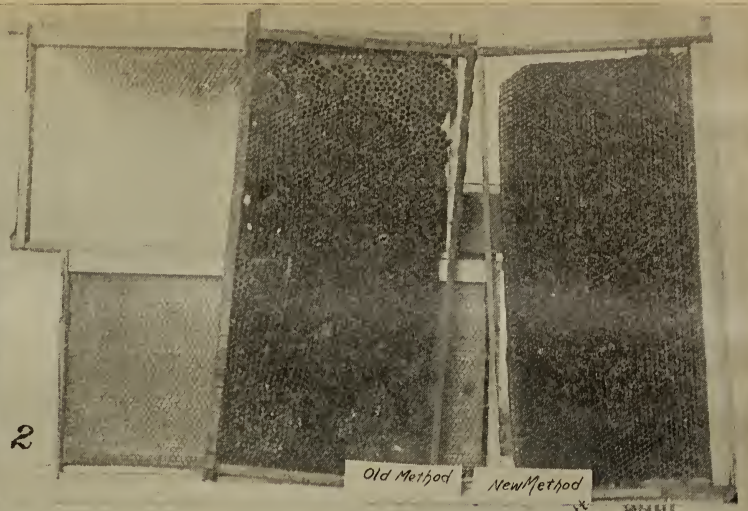
Old Method
New Method

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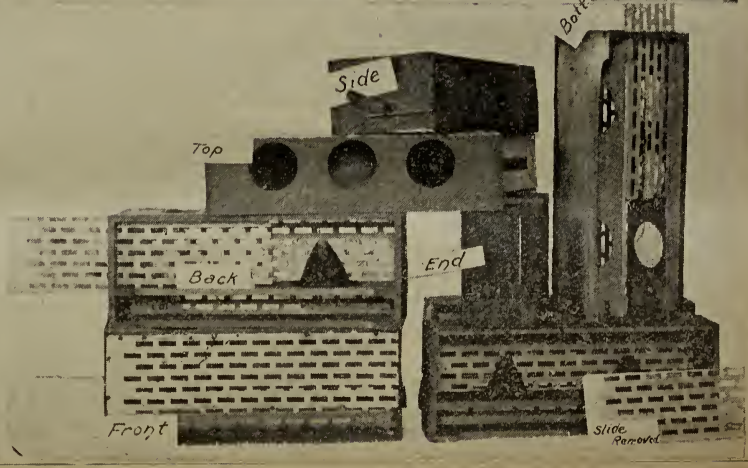
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CONVENTION OF THE SOUTHWESTERN WISCONSIN BEE-KEEPERS' ASSOCIATION.

The Good Work Done by the Foul-brood Inspector.

BY HARRY LATHROP.

The above association, of which Mr. N. E. France, our untiring foul-brood inspector, is president, met at Lone Rock, Wis., Oct. 5th and 6th. This place, being on the Wisconsin River, at the outlet of the Richland Co. country, and within easy reach of the great basswood regions on the Kickapoo, where there are many bee-keepers, a large attendance was expected; but in this the few faithful ones were disappointed. Those who attended had a very pleasant time. The local bee-man, Mr. F. Z. Dexter, made it as pleasant as possible for us. A hall free of charge was provided for the meeting, and a lady choir came in and treated us to some splendid vocal music.

One notable attraction at this convention was the photographs of various apiaries and buildings pertaining to bee culture, which N. E. France had taken with his camera on his various trips over the State, while in the discharge of his official duties. These were placed at the end of the hall, and there were enough of them to cover several square yards of surface. The display was very instructive. Every thing was shown, from the picture of a prosperous apiary down to that of a great pile of empty hives with the inscription, "Bees all dead—results of foul brood." Mr. France, with his views, would be a winning card for any bee-keepers' convention where his attendance could be secured.

On account of the small number present, very little convention work was attempted, and at noon of the second day the meeting was adjourned. We feel like throwing something at the bee-keepers over on the Kickapoo for not taking enough interest to attend when the convention was held within easy reach of them all, and they had a good honey crop this year, too. Evidently, Wisconsin bee-keepers fail to appreciate the importance of this work.

I had the pleasure of making a brief report of the Omaha convention, and at the close several came forward and joined the United States Bee-keepers' Union.

We had the pleasure, on the second day, of the presence of Mrs. Pickard and daughter, of Richland Co. Miss Pickard has recently been spoken of in the *Amer. Bee Journal* as being "the sweetest girl in Wisconsin." Eight tons of extracted honey was the product of the outapiary which she handled without assistance. How grand to see a young woman making herself independent by her own effort, instead of (as many do) growing up as useless butterflies, flitting from one vain thing to another! The entire crop produced by the Pickards was 50,700 lbs. extracted, from about 400 colonies. The experience and advice of such successful bee-keepers are eagerly sought in conventions. Success is more than any amount of theory. The above-mentioned yield must not be taken as an indication of the general yield of the State. Mr. France estimates this year's crop in Wisconsin at one-third of that of last year, and for the whole of the United States at one-fourth. But, despite the short crop, it was stated by Mr. France that many bee keepers in the State, who had produced a few hundred or thousand pounds of honey, had sold, or offered to sell it, at prices as low as or even lower than the low price of last year. It is a well-known fact that, when farmers have butter and eggs to sell, they do not show such a lack of good business sense. They want the full market price, and they get it too.

Another convention of Wisconsin bee-keepers will be held at Madison in February, and we hope the bee-keepers will redeem themselves by a large attendance. Our foul-brood inspector has done a noble work. The disease has been stamped out over large districts; but other infected districts await the same persistent effort.

Browntown, Wis., Oct. 18.

THE PETTIT SYSTEM NOT NON-SWARMING, NO CLAIM FOR THAT, BUT AGAIN SATISFACTORY.

Large Entrances Defended; The Danzenbaker Floor a Good Thing, but may be Improved.

BY S. T. PETTIT.

I read with some surprise Mr. Doolittle's reply to Dr. Miller on page 760, where he (Mr. Doolittle) insinuates that I claim my system of taking comb honey is a non-swarming one. I wish to say that I do not set up any such claim. But I do claim that the large entrance, and proper distribution of the bees to the uttermost parts of the super, and holding them there by the use of dividers, so relieves the pressure in the center of the hive that it makes the bees feel cool, free, and easy—indeed, the bees feel that there is more room in the hive, and so I reason that swarming is held back for a time at least, Mr. Doolittle's three swarms to the contrary notwithstanding.

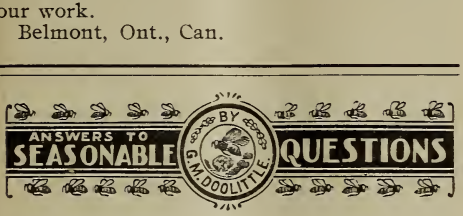
That the large entrance and wedges cause the outside sections to be beautifully finished, this season's operation has again fully demonstrated, in my yard at least; and, again, I say I have no doubt that more honey can be taken by this method than by the old way, both comb and extracted. It is no uncommon thing to find the outside combs in the extracting-supers better finished than the center ones.

The Danzenbaker floor is a good one, but I believe that, if you would lower the rear end of the hive to something like half an inch by making the sides of the floor wedge-shaped you would like it better: then the hive would be perpendicular, and the floor would be just right to help the bees clean house and to throw the water off.

Returning to Mr. Doolittle, let me say it seems to me very unfair to test a system, and in that test leave out half of that system. He does not tell us that he used the dividers in that experiment. Is that fair and just? Mr. Doolittle seems to think that he settled nearly every thing in bee-keeping twenty-five years ago, and now he doesn't have to test any

thing thoroughly and in good faith. But, of course, he must test things just enough to prove the falsity of their claims. But, for all that, I appreciate the many good things that Bro. Doolittle has from time to time told us in his writings, and no doubt there will be advancement when both he and I have finished our work.

Belmont, Ont., Can.



STRAIGHT WORKER COMBS WITHOUT FOUNDATION.

Question.—Will you please tell us in GLEANINGS how straight worker combs can be secured without the use of comb foundation? I wish to make my frames this winter, and put them in shape for next summer's use, and I do not wish to use foundation in doing so. Knowing that you kept bees before the advent of foundation I thought you might give those who do not wish to purchase foundation for their brood-frames some light on this matter.

Answer.—To have all of our combs built true in the frames, so that each comb is as true as a board, is certainly worth working for, to those who handle their frames. The object of frame hives is to allow of a better control over the inside of the hive than could be done with box hives; and only as these frames are movable, in the fullest sense of the word, is this object secured. We often see combs so bulged or crooked in the frames that they will not allow of being changed to different parts of the hive, or from one hive to another, in which case the hive containing them can scarcely be called a movable-frame hive.

As a starting-point toward straight combs I would use a strip of foundation, half an inch wide, as a guide for the bees to follow the center to the top-bar to the frames, even did such foundation cost me two dollars a pound; for where no such guide is used it is impossible to secure the combs built true in the frames. If any person is so set against foundation that he will not use it any case, a wax guide can be put on the under side of the top-bar to the frame, which is secured by making a straight-edge of hard wood, the thickness of which is equal to half the width of the top-bar to the frame, by one inch wide, and ¼ inch shorter than the inside of the top-bar is long. This straight edge is nailed to a wide board, and the board is so fixed that it inclines enough for the melted wax (which is to be used to make the guide) to run along the top-bar freely. With a wet sponge moisten the straight-edge; lay the frame on the wide board with the under side of the top-bar pressed against the straight-edge, when a little wax is turned from a spoon into the upper edge of the V-shaped trough (which is made by the top-bar of the frame and the straight-edge), and allowed to run down the whole length of it. Now lift the frame and you have a wax-guide for the bees to start their comb on. By keeping the straight-edge wet, the wax will not stick to it; and, by using a lamp under the dish of wax, it can be so regulated that the wax is kept at the right temperature all the while. In this way guides can be put on very rapidly, but they are not nearly as good as the strips of foundation, as the latter has cells started on it, while the other is only a plain strip of wax. While I have found a guide of some kind an actual necessity (the above two being the best), I have also found that no guide can always be depended upon, for the bees are sometimes very obstinate, and will leave any guide, or gnaw the wax off, so as to build crooked combs, if they do not go directly across the frames. Consequently it pays the apiarist to look at each colony hived on empty frames, while they are building comb, as often as once in three days. If any combs are going wrong, they can be bent back in line very easily, and after the hive is once filled they are good for many years, as I have never yet seen a comb that I would discard on account of age, although I have now kept bees for nearly thirty years.

To best illustrate how to manage I will give my way of working with a swarm of bees hived in any hive having frames with only starters in them. As all of my queens have their wings clipped the swarm is hived by letting them return, previously moving the parent colony to a new location, and setting the hive containing the full number of frames in its place. In two days I open the hive, and usually find that the bees have made a start on five frames. These five frames are placed together at one side of the hive, and a dummy or division-board is placed next to them. This throws the full force of bees on these frames, and they will soon fill them with straight worker-comb, as a rule, especially if sections are placed over them, as they always should be, so that, if much honey is coming in, it may be stored in the sections rather than be an incentive for the bees to build drone comb in which to store it. This also gets the bees to work in the sections quicker than any other way I know of. If we get these five combs built straight there will be no trouble in having the rest so, as they can build them no other way if placed between two of those already built. If every comb in a hive is straight and all worker, other conditions being equal, such a colony will be a profitable one; and if each colony is in like condition, all will be profitable. No bee-keeper, even if he has not more than three or four colonies, should consider them in proper working condition until each comb is a straight worker comb. There is no need of having hives half full of drone comb, and so crooked that they can not be handled. If we do things at the right time and in a proper manner, our bees will more than pay us for all of the time spent on them.

Suppose that, instead of working as above, we hive our swarms without paying any further attention to them. Swarms issuing when

honey is very abundant will build comb very rapidly, filling their hive in eight or ten days, thereby building comb in advance of the queen, in which case their comb will be apt to be crooked, and at least one-third drone or store comb which is good for nothing for rearing worker bees the next season, but an actual damage, as the drones reared in them will consume a great part of what honey the workers gather. Such colonies will always be unprofitable ones, either for rearing bees or storing honey, just so long as left in that condition; and, if unprofitable, the bees will be neglected more and more, and the keeping of bees be declared by the owner as a "delusion and a snare," while had their keeper attended to them while they were building combs, and then given them the attention needed afterward, success would have crowned the effort, and bee-keeping would have been declared one of the nicest and most profitable pursuits in the world. Any business is profitable only as we put our thought and energy into it, bee-keeping being no exception to this rule.

ANOTHER VICTORY FOR THE NATIONAL UNION.

Mr. J. C. Kubias, of Redlands, Cal., has been sued by W. F. Whittier for damages, and he prays for an injunction restraining Mr. Kubias from keeping bees within one mile of his land, claiming that the bees befoul the water used for irrigating and domestic purposes, and also sting men who work in the fields adjoining the apiary. Mr. Kubias' apiary was located there before Mr. Whittier planted his orchard, and should have prior right to the location—if there is to be any preference.

The National Bee-keepers' Union assisted the defendant with "points of law," and money to defray the expenses of a lawsuit. When it was known that the Union was interested in the defense, the plaintiffs weakened and bought out the defendant's homestead. Mr. Kubias returned the money to the Union, and wrote thus:

Whittier acknowledges, through his attorneys, the correctness of our position, and bought my rights to the homestead entry on which my bees are located. The fact that the National Bee-keepers' Union was back of me was the most potent factor in not allowing the case to come to trial. J. C. KUBIAS.

As soon as the enemies of the pursuit of bee-keeping understand that the National Bee-keepers' Union is interested in the defense, they generally waste no time in trying to settle the matter by compromise or letting it drop entirely. This shows the value of organization, in maintaining their rights and demanding their privileges. "In union there is strength." Bee-keepers should remember this, and lose no time in becoming members of the National Bee-keepers' Union.

THOMAS G. NEWMAN, Gen. Mgr.

THE GOLDEN HONEY; WHY SOME OF IT (P. 690) WAS DARKER.

E. R. Root:—Your footnote relating to your judgment as to the cause of so great a difference as to color of sections (comb honey), page 690, would have been a correct answer if you had put it "characteristic" instead of "difference" in bees; but I presume you meant that the same kinds of bees possess different characteristics as to the capping and building of comb; and, as I stated, I'll tell just why that third row shows up so much darker. Those three colonies are all three-banded Italians that I had to leave over from last year with unchanged queens, and the one from which No. 3 sections were taken was one of the best colonies I ever owned for storing large amounts of honey; but when capping they would just spread a thin coating of wax over the honey, and glass it over, giving it a greasy appearance; besides, one could scarcely handle the combs, being so fragile—brood-cappings having a good deal the same appearance. When offering this section honey in the market, inquirers wanted to know if a coat of paint had been put on the honey. So you can readily solve the question.

Sections in No. 3 contain the same kind of honey as 1 and 2; but the cappings being smeared right on the honey, it shows badly; and had the honey been light you could hardly have told where the cell-cup walls were; therefore a $5.00 breeder reigns in her stead.

But, Ernest, there is no doubt in my mind that the open separators have much to do in more quickly curing honey. This is one of the essential features of my method which, if you will take time to consider for a few minutes, you will see afford a free ventilation throughout the entire combination hive. This undoubtedly hastens evaporation, as all will admit; but I have noted down in my diary to fully and properly test the three separators in the one hive next season.

Reinersville, O. J. A. GOLDEN.

[This should be taken in connection with what is said on page 806.—ED.]

BEE-SPACE BETWEEN COMB SURFACES, AND HOW IT VARIES WITH DIFFERENT KINDS OF BEES.

Mr. Root:—I notice the disagreement going on in your paper as to the width of space between well-filled sections, and that you call for the opinion of honey-producers as to what they know about it.

Now, I believe all are correct in the measurements they have given, as every one has, no doubt, been accurate as his bees did the work.

Bees are not all of a size. The blacks differ in size as well as the Italians.

In this locality there is a small black bee that does not leave a space between the sections more than two-thirds as wide as some of the Italians. Then there is the brown bee, fully as large as the common Italian, and yet it is called the black bee, and the space between the combs they leave is substantially the same as with the Italians.

The five-banded bee, the Duval strain, is the largest bee I have ever seen, and the space between the combs they build is much wider than the common Italian or the black.

I have never been able to note any difference in the width of space between sections built by Punics or Carniolans or black bees. I believe every man has been honest and accurate in his measurement of space between sections as his own bees left the space.

IRA BARBER.

De Kalb Junction, N. Y., Oct. 12.

HOW TO LIQUEFY HONEY CANDIED IN GLASS.

I have not as yet seen any thing in GLEANINGS about liquefying honey by placing it in the oven of a common cook-stove. I have done this for the past three years instead of placing it in a basin of water on top of the stove, and I can assure you it is far superior to the latter. Some might think there is more risk of breaking the glass when honey is in glass packages; but that is not the case, as I have broken some by placing them in water on top of the stove, but have not as yet broken a single one by placing them in the oven. It is not necessary to place them (tumblers I mean) in water.

My method is to take a shipping-case and place the tumblers in, or other glass packages, whatever the honey may be in. Place them in the oven, close the door, and in ten to thirty minutes your honey is liquid again, and that, too, without even so much as spoiling the labels. The hot air does not seem to act on the glass as does hot water, and still is more rapid. I have liquefied hundreds of tumblers of honey, and know whereof I speak.

Bellevue, O. H. G. QUIRIN.

[Your method will do nicely in a small way.—ED.]

HOW BEES DISLIKE BLACK; CANDIED HONEY IN TIN PAILS; HONEY-LEAFLETS FOR SELLING HONEY NOT A SUCCESS.

From what I read in GLEANINGS you think bees do not object to dark colors. If you will turn a hen with a dozen newly hatched chickens, while they are downy, eleven white and one black one in the lot, if the black one does not get more stings than the others, I will pay for the use of the hen to hatch the chickens. My chicks run in my bee-yard. The black ones are screaming from stings continually, but a white one is hardly ever stung. The young man who helped me this summer with my bees wore light-colored pants when he commenced work, and got no stings through his pants; but he wore dark pants one day, and the bees punished his legs so he was glad to put on light trousers again. If you want to prove to your own satisfaction that bees don't like black, wear a black or dark-brown cardigan jacket, with the sleeves turned down around your wrists, or tie a strip of dark woolen cloth around your wrists one day while working among your bees, and I think you will get more stings on your wrists at the edge of the dark cloth than you ever did in one day before. They serve me that way, and I have Root stock in my yard.

I have learned that, in peddling honey, I can sell candied honey in tin pails to people who will not touch it if in glass jars.

I have had of you 2500 of the honey-leaflets, and have handed most of them out to customers and acquaintances and others. I don't think they have sold a pound of honey for me, or helped my trade in any way. I can not learn of a single person who has used any of the recipes for baking or cooking, and only two have said they would try them. I should like to know what the experience of other bee-keepers has been in the use of the leaflets.

E. D. HOWELL.

New Hampton, N. Y., Sept. 27.

[On page 661 you will note I acknowledge that, in view of the evidence that has been pouring in, to the effect that bees dislike black, Dr. Miller was right and I wrong, although I have received one report from one who says he could not discover that bees have any more antipathy toward one than the other color.

As to those honey-leaflets, your experience seems to be quite the opposite of that of many others. However, we should like to hear from others. Let us know positively whether the distribution of leaflets of this sort does accomplish the result sought.—ED.]

HEARTSEASE HONEY; CLEATS ON HIVES.

Heartsease gave us a good yield in this locality during the latter part of August and the whole of September. It has failed us so often in the past few years that few of us were prepared, myself among the number, and did not get the surplus arrangements on in time. We put on second stories with brood-frames in them. Some of my best colonies filled their second stories full, and commenced on a second lot, but did not finish them; in fact, all colonies did that did not swarm. Heartsease is the "bacon and beans" of all honey for my family. We can eat it the year round, and never tire of it. When heartsease fails I buy a 60-pound can of extracted, either white clover or alfalfa. It seems "awful nice" at first, but we soon grow tired of it, and long for the old standby, heartsease. I often wonder if this is the way we have been raised, or is it our peculiar taste?

I want no more eight-frame hives. They are too small, and do not give as good results as larger hives in this locality. I want cleats on my hives, by all means, instead of handholes.

M. F. TATMAN.

Rossville, Kan., Oct. 6.

SMALL HIVES FOR COMB HONEY.

I notice in GLEANINGS a series of articles on large hives. I should like to give my experience with them. I believe the Dadants work for extracted honey only; but for comb honey I want the Simplicity with seven frames and two dummies for the brood-nest. Let me tell you what I have done with this size. I have, in the very poor season just past, secured 80

lbs. of comb honey from one colony, and no swarm, while some of the twenty-frame (two-story) colonies were swarming whenever it was not raining. I need not tell you how much surplus I got from these hives. I have been keeping bees about twelve years, and have never had a queen that would fill ten frames with eggs; so, what are these two or three extra frames for? I should like to tell you how I work my bees for comb honey; but some one would say, "That was tried and discarded years ago, when they had kings in the bee-gums." G. H. MILLER.

Bluffton, Mo., Oct. 13.

[Never mind, friend M. Send on your method; and if it is not too ancient we will give it to our readers.—ED.]

HOW TO STOP ROBBING WITH PERFORATED ZINC.

I have been keeping from 50 to 175 colonies for the last seven years, and I don't think my method of stopping robbing failed once where the colony was of any account. Place a strip of excluder zinc in front of the entrance, and close to a one-bee space if necessary. In seven years I have had one crop failure (1897), and 1898 is a half-crop. The other five years have averaged about 50 lbs. surplus per colony.

S. LINDERSMITH.

Faribault, Minn., Oct. 4.

[This method has been before proposed, and I think it worked successfully.—ED.]

THE FENCE AND PLAIN SECTION COME TO STAY.

I have just taken off a few of the plain sections (with fences), and I have this to say about them. Most of the sections are well filled. A few were attached to the fences by burr-combs — not more than with the plain separator, however. I think the fence and plain section have come to stay.

WM. H. EAGERTY.

Cuba, Kan., Sept. 29.

E. S. H., Ind.—We use planer-shavings as packing for bees, although any clean good dry chaff or dry leaves might do just as well. We use planer-shavings because they are more available for us but wheat chaff might be more easily obtained by you.

J. S., Mich.—Certainly bees can be kept profitably in Cuba, and have been for years. The statement that it is necessary for bees to pass through a cold winter as an incentive to store during summer is all bosh. In regard to the yarn concerning manufactured comb honey, just hand them one of our $1000 reward-cards.

A. S. B., Ont.—The trouble was, you allowed the bees to swarm, taking with them the old queens. The virgin queens that were left with the parent colonies went out with the after-swarms, one at a time. The consequence was, the parent colony was left depleted in strength, and queenless and broodless. After-swarming should be controlled. To accomplish this, see the methods advocated in any of the standard text-books.

J. B. K., N. H.—While not positive, I am under the impression that he who first discovers a bee-tree, and marks his initials thereon, has the first legal claim to the bees; but before he can procure them he must obtain the consent of the owner of the tree. If the owner objects to letting him take the bees, then legally they would be his, but he will be powerless to touch them. You can feed bees quite late in the season, almost clear up to freezing weather; but it is advisable to feed much earlier, in order that the syrup may become thoroughly ripened or thickened.

J. K., N. Y.—We send you our catalog, which will give you full particulars in regard to making sugar syrup and how to feed. See page 28. As to the amount of stores, we usually estimate that a colony should have at least five or six combs, or their equivalent, of sealed stores. In other words, bees should have about 25 pounds of honey or sugar syrup after it has been thickened down by them. Feeding would not be necessary if honey is stored in the second story, but I would advise taking out the empty combs above and replacing with sealed combs, perhaps leaving an empty frame in the center for the bees to cluster on.

R. E. J., Ill.—We do not advise putting sand or sawdust around hives, especially at the entrance, to keep down the weeds, for the weeds will surely grow through it. Our practice is to sprinkle about half a handful of salt in front of the entrance of all the hives. An entrance-board is very often used — that is, a board about 8 or 9 inches wide, and in length equal to the width of the hive. This board should be placed against the front of the hive. Any old cheap inch lumber will do. When going around the hive with a lawn-mower lift up the board, run the mower over the space bordering the edge of the board, and then replace the board.

F. G., N. Y.—It is not possible to remove stains from the cappings of honey. The only thing that can be done is to grade such honey as seconds, and sell for less money. The color of the wax may be dependent upon the bees, but probably more upon the locality and the age of combs at the time of rendering. New comb of the first year will be of a very light yellow, or almost white. I note that you state that your honey has yellow cappings, and that honey you see on the market is very white. It is probable that you left your honey on the hive too long; but, what is more probable, your honey is of a light amber color, and this to a certain extent affects the color of the cappings.

EIGHT extra pages this time.

Do not forget to look over our remarkably low clubbing offers given elsewhere, for we can save you money.

THE weather in our section of the country has been exceedingly disagreeable. Instead of the beautiful Indian summer which we usually have about this time, we have been having rain, rain, rain; and this, coming at a time when we were trying to enlarge our factory, has put us back not a little.

MR. COWAN'S TERRIBLE BEREAVEMENT.

The *British Bee Journal* of Oct. 20 contains the following very sad piece of news:

With the most profound sorrow we have to announce the sad news that Miss H. M. Cowan, the eldest daughter, and Mr. Herbert F. Cowan, the second son, of our senior editor, were passengers on board the ill-fated Atlantic Liner *Mohegan*, wrecked off the Cornish coast on Friday last, and that the lives of both were lost.

After receiving the *B. B. J.* the following from the assistant editor of the paper came to hand:

Dear Mr. Root:—The obituary notice on first page of our journal for Oct. 27 renders it unnecessary for me to say any thing further here about the sad event which called it forth; but just when leaving London for California, Mr. Cowan asked me to write you and say how much he regretted that, under the changed circumstances he would be unable to fulfill his promise to call on several bee-keepers in your country, the family going straight through from New York to Loomis. If you will, therefore, kindly make this known through your columns, I shall be much obliged. W. BROUGHTON CARR.

London, Eng., Oct. 29.

I am sure that Mr. and Mrs. Cowan will have the sympathy of the bee-keeping world. It is not often that we have to record any thing so sad.

A CORRECTION.

THE stenographic report of the Omaha convention proceedings is unusually full and accurate. I have read nearly all of it, and see very few if any corrections to make. I note, however, in the *Amer. Bee Journal*, page 660, in the report of this convention, where I speak of the adulteration of honey and the difficulty of feeding bees clear glucose, the reporter makes me say this: "We are trying every year to feed pure glucose to bees. I learned this summer that you could dilute it down with water, and they would take it provided there was nothing else that was coming in." What I *meant* to say, and what I probably did say, was that we tried *one* year to feed pure glucose to bees, instead of our trying to do it *every* year. This last construction might imply that I had some sinister motive; and after all I have said against glucosed honey and glucose in general, this would be rather a travesty on your humble servant.

I lay no blame to Bro. York, as it takes a pair of sharp eyes to catch every error that may creep through the stenographer's pencil.

FIRE AT THE HOME OF THE HONEY-BEES.

ALONG about half-past ten on the night of Saturday, Oct. 29, our big chime whistle gave forth a blast that I knew, as I hopped out of bed, meant something wrong. Going to the front door, in my night-clothes, I saw the flames leaping twenty feet over the top of one of our largest buildings. As I stumbled over chairs and other articles too numerous to mention, I yelled out to Mrs. Root to strike a light. While I was hastily putting on my clothes, it seemed to me that the whole plant would have to go in spite of us. But I had no sooner got out of the door than, presto! the flames that had been shooting up skyward were gone. As I wended my way in between the buildings I found nothing but a cloud of steam, and I heard some one yelling, "Shut off the water!"

Our factory building is patrolled nights and Sundays by watchmen; and to make sure they do not go to sleep, an electric clock keeps track of their whereabouts throughout the whole night and day.

On the night in question, the night watchman, discovering the fire, called to one of the men sleeping in the building, and the two, in the space of two or three minutes, with the aid of the big fire-pump (always under steam pressure), fairly deluged the fire. But they had no sooner got to work than the automatic fire-extinguishers, or Grinnell sprinklers, were in active operation. The automatic electric fire-alarm was pealing forth its warning; and when the members of the Root Co. arrived on the scene there were about a dozen men ready to lend a helping hand, but there was absolutely nothing to do.

The automatic fire-equipment is so arranged that it works mechanically, without the intervention of any human being; and, even if the night watchman should go to sleep, and the electric time-detector should stop, this silent watchman of the night, that never sleeps, stands ready, not only to put out the fire, but to ring in an alarm. We have now had it in for a period of eight or nine years; and during all that time it has not even had a chance to demonstrate its ability to put out fire.

The fire-pump itself is called a half-million-gallon-capacity machine—that is, it will throw a quantity of water equal to the average city fire-engine. As fire is kept up under the boilers night and day, the pump is ready for instant service.

BETTER GRADING AND HIGHER PRICES FOR HONEY IN PLAIN SECTIONS.

IN talking with our honey-man, Mr. A. L. Boyden, who is also secretary of the Root Co., he said several things about plain sections that I think will be of general interest to our readers. I asked him, therefore, to write a statement for print, and here it is substantiating another statement, by Byron Walker,

to the same effect, that appears on p. 805 of our last issue.

As an instance of the favor with which the plain sections are meeting, and not only this, but their real value, we cite the following: We have just received a shipment of a lot of honey from a prominent bee-keeper. About a third of this was No. 1 white, and the rest was "fancy white," and in this "fancy white" we found one crate of about 200 lbs. marked "Extra Fancy, Plain Sections." Now, we do not remember any correspondence with this party in regard to the plain sections whatever. We do not even know that he is a subscriber to GLEANINGS, and in his letter he does not mention that the honey was marked in this way. He has simply marked it according to his judgment, and any one seeing the honey will say there is no mistake about it.

We have handled a good many thousand pounds of comb honey this fall; and whenever we have been able to get honey in plain sections we have found even readier sale for it than for the old style.

We sold a ton of very fine honey in old-style sections to a party in a Southern city, and this is what he writes: "The 1903-lb. lot was fine honey, but it is a pity he did not have fences." We also sold him at the same time another lot among which were a lot of plain sections; hence the comparison that he makes above.

I have just received a letter from J. E. Crane, in the same line, and from it I make an extract that will speak for itself.

> As I wrote you the other day, it seemed quite plain and certain that bees would seal honey faster the latter part of the season when between fences than when between close separators; and this is the way I came to think so. Near the close of the season I took off all finished supers, yet leaving on a large number nearly finished—i. e., the combs were well built out, but not quite full of honey, and perhaps not half sealed. Many of these had plain sections with fence, as well as old-style sections with a fence cleated with tin, like the sample I sent you.
>
> When I came to go over my hives a week or ten days later I *seemed to find a much larger proportion of those supers supplied with fence ready to come off than those without them.* After working a while I came to feel quite sure that, if I opened the top of the super, and found a fence instead of old-style separators, I should find the combs all finished, and was not often, so far as I remember, disappointed.
>
> Now, this is not a mathematical demonstration, yet we Yankees have a way of guessing that answers pretty well.
>
> I have been wondering, since I wrote you the other day, if this is not the reason that plain sections appear whiter and less travel-stained than the other sections. It seems to be the general opinion that they are whiter. The bees ripen their honey faster, and seal more promptly, which gives them a finer appearance. Of the 2000 plain sections I used this year, I believe *all* went into my best grade except ten or twelve that were unfinished, and a few that got broken.
>
> I was glad to see your frank admission of the failure of drawn or deep cell foundation; I tried it in a small way, but was myself disappointed in the result. I trust you will gain in the confidence of people more than the present financial loss. J. E. CRANE.
>
> Middlebury, Vt., Nov. 7.

Italics above are my own. On the other hand, Mr. Crane, with his usual caution, does not wish to be understood as making a positive statement regarding the plain sections.

I have an earlier letter from him on the same subject, which I hope to give in our next issue.

Regarding drawn foundation, I want the truth to come out, cost what it may. I feel the same about plain sections. If they can't stand on their merits I'll help dump them overboard.

APICULTURAL EXHIBITS AT OMAHA.

ELSEWHERE in this issue we present a general interior view of the Apicultural Building at the Omaha exposition. I have already given photos of the G. B. Lewis Co.'s and the Root Co.'s exhibits, both of which show in the general view.

The first exhibit in the foreground is that of the Leahy Mfg. Co. At the left is the Lewis Co.'s exhibit, and back of that still, as shown by the sign, is the Nebraska honey exhibit. Other exhibits are shown further down—one from L. D. Stilson, and others whose names I do not now recall. Clear to the further end of the building, just over the doorways, on a sort of balcony, are several observatory hives, with entrances through the wall. On the right are exhibits of honey from the various States; and in the very foreground, not shown in the picture, is an extensive exhibit of E. Kretchmer, a view of which I will give a little later.

This building, as will be seen, is not only large enough to accommodate all the various exhibits, but it was very artistically arranged and decorated inside.

No other exposition management has ever shown to bee-keepers the same consideration as has the Omaha; and now, having secured recognition to such an extent, we ought to be able from now on to obtain similar recognition from other exposition authorities. But in order to obtain it, it will be necessary to send such men as Whitcomb, Stilson, and Abbot — men who not only *know* what they want, but are able likewise to *obtain* what they ask for.

The list of prizes that were awarded by the judge to the various exhibitors is given below. I may be pardoned for remarking that the Root Co. carried off its full quota of gold medals, as well as other prizes.

The following premiums were awarded in the Apiarian Department of the Trans-Mississippi at Omaha by Hon. Eugene Secor, of Forest City, Iowa:

Bee Hives.—Emerson T. Abbott, St. Joseph, Mo., St. Joe hives; bronze medal. Douglas Co., Omaha, Neb., improved Langstroth hive; bronze medal. E. Kretchmer, Red Oak, Iowa; collection of bee-hives, gold medal. G. B. Lewis Co., Watertown, Wis., collection of bee-hives; gold medal. Leahy Mfg. Co., Higginsville, Mo., collection of bee-hives; silver medal. The A. I. Root Co., Medina, O., collection of hives, gold medal.

Apiarian Implements and Supplies.—E. Kretchmer, Red Oak, Ia., gold medal. G. B. Lewis Co., Watertown, Wis., gold medal. Leahy Mfg. Co., Higginsville, Mo., silver medal. The A. I. Root Co., Medina, O., gold medal.

Bee-books and Bee-literature.—E. Kretchmer, Red Oak, Ia., honorable mention.

Alsike-clover Comb Honey.—L. G. Clute, Greeley, Ia., bronze medal.

Heartsease Comb Honey. — L. D. Stilson, York, Neb., silver medal. L. G. Clute, Greeley, Ia., bronze medal.

Dandelion Comb Honey.—L. G. Clute, Greeley, Ia., honorable mention.

Alfalfa Comb Honey.—E. Kretchmer, Red Oak, Ia., silver medal. Hon. G. W. Swink, Rocky Ford, Colo., silver medal. Lovesy & Bourk, Salt Lake City, Utah,

bronze medal. Bennett & Dieshum, Garden City, Kan., bronze medal. I. L. Dieshum, Garden City, Kan., bronze medal.

Linden Comb Honey.—Nebraska Commission, York, Neb., silver medal. Douglas Co., Omaha, Neb., silver medal. E. Kretchmer, Red Oak, Ia., silver medal. L. G. Clute, Greeley, Ia., bronze medal.

Sweet-clover Comb Honey.—Wm. Stolly, Grand Island, Neb , silver medal.

White-clover Comb Honey.—Dr. E. C. Jaques, Crystal, Minn., silver medal D. A. Freeman, Hinckley, Minn., silver medal. Mrs. H. G. Acklin, St. Paul, silver medal. L. G. Clute, Greeley, Ia., silver medal. E. Kretchmer, Red Oak, Ia., silver medal. Lovesy & Bourk, Salt Lake City, Utah, honorable mention.

Honey in Different Stages of Granulation.—L. D. Stilson, York, Neb., honorable mention. E. Kretchmer, Red Oak, Ia., honorable mention.

Samples of Honey.—Aug. C. Davidson, Omaha, silver medal. L. D. Stilson, York, Neb., gold medal. State of Minnesota, St. Paul, silver medal.

Heartsease Extracted Honey.—Douglas Co., Omaha, silver medal L. D. Stilson, York, Neb., silver medal.

Sweet-clover Extracted Honey.—Douglas Co., Omaha, silver medal. Wm. Stolly, Grand Island, Neb., bronze medal. Nebraska Commission, York, Neb., bronze medal. E. Kretchmer, Red Oak, Ia., bronze medal.

White-clover Extracted Honey.— Lovesy & Bourk, Salt Lake City, Utah, bronze medal. G. M. Whitford, Arlington, Neb., silver medal. E. Kretchmer, Red Oak, Ia., silver medal. L. G. Clute, Greeley, Ia., silver medal. Dr. E. K. Jaques, Crystal, Minn., silver medal. J. B. Jardine, Parker, Minn., silver medal H. L. F. Witte, Minneapolis, silver medal. D. A. Freeman, Hinckley, Minn , silver medal. Mrs. H. G. Acklin, St. Paul, Minn., silver medal. W. J. Stahmann, Weaver, Minn., bronze medal. Scott Lamont, Jerrett, Minn., bronze medal.

Extracted Buckwheat Honey.—Douglas Co., Omaha, no recommendation.

Alfalfa Extracted Honey. — G. W. Swink. Rocky Ford Colo., silver medal. Lovesy & Bourk, Salt Lake City, Utah, bronze medal. E. Kretchmer, Red Oak, Ia., bronze medal. A. G. Forney, Turner, Kan., honorable mention. Fred H. Glick, Atchison, Kan., bronze mecal. Bennett & Dieshum, Garden City, Kan., honorable mention I. L. Dieshum, Garden City, Kan., bronze medal. Nebraska Commission, York, Neb., honorable mention.

Linden Extracted Honey.—Nebraska Commission, York, Neb., silver medal. Aug. C. Davidson, Omaha, bronze medal. L. G. Clute, Greeley, Ia., silver medal. Douglas Co., Omaha, silver medal. Nathan Jones, Howard Lake Minn., bronze me 'al.

Raspberry Extracted Honey.—Nate Williams, Nimrod, Minn., silver medal.

Honey in Marketable Shape.— Aug. C. Davidson, Omaha, bronze medal. Nebraska Commission, York, Neb., bronze medal.

Honey Sugar.— L. D. Stilson, York, Neb., silver medal.

Honey-producing Plants, Pressed and Mounted.—Winnie L. Stilson, York, Neb., gold medal. Douglas Co., Omaha, bronze medal. Cleveland Cross, York, Neb., bronze medal. Clark E. Bell, York, Neb., bronze medal.

Unrefined Beeswax.—E. Kretchmer, Red Oak, Ia., silver medal. Douglas Co., Omaha, honorable mention. L. D. Stilson, York, Neb., bronze medal.

Designs in Beeswax.—Mrs. E. Whitcomb, Friend, Neb., gold medal. Douglas Co., Omaha, silver medal. Mrs. Mary Segar, Omaha, Neb., silver medal. Mrs. Della Benson, Omaha, silver medal

Reproduction of Bee Culture 50 Years Ago.—Douglas Co., Omaha, silver medal.

Sweets in which Honey is Made to Take the Place of Sugar.—Mrs. E. Whitcomb Friend, Neb., silver medal. Mrs. Frank J. Preiss, Omaha, silver medal.

Exhibit of Bees and Queens in Cages.—Nebraska Commission, York, Neb., silver medal. Douglas Co., Omaha, silver medal.

Exhibit of Queens in Cages.—E. Kretchmer, Red Oak, Ia., honorable mention.

Experimental Test of Full Colonies of Bees.—Douglas Co., Omaha, silver medal.

Honey Vinegar.—G. M. Whitford, Arlington, Neb., honorable mention. Douglas Co., Omaha, honorable mention.

Metheglin. — Aug. C. Davidson, Omaha, bronze medal.

NEBRASKA FARMER SPECIAL PREMIUMS.

Display of Culinary Products in which Honey is Made to Take the Place of Sugar.—Mrs. E. Whitcomb, Friend, Neb., 1st.

Display of Honey, Supplies, Bees, and Queens.—Nebraska Commission, York, Neb., 1st.

Display of Designs in Beeswax.—Mrs. E. Whitcomb, Friend, Neb., 1st.

Largest and Best Display of Designs in Beeswax.—E. Kretchmer, Red Oak, Ia., 1st.

Largest and Best Display of Bees and Queens.—L. D. Stilson, York, Neb., 1st.

Best and Largest Display of Extracted Honey.—Nebraska Commission, York, Neb., 1st.

Best and Largest Display of Comb Honey.—Nebraska Commission, York, Neb., 1st.

Honey-producing Plants.—Winnie L. Stilson, York, Neb., 1st.

Display of Apiarian Goods and Implements.—A. I. Root Co., Medina, O., 1st.

Display of Honey, Bee-supplies, and Queens.—E. Kretchmer, Red Oak, Ia., 1st.

THE QUALITY OF SOUTHERN HONEY.

THE editor of the *Amer. Bee-keeper* protests (and rightly too) against the statement wherein I am made to say in the report of the Omaha convention, that "Southern honey has a strong flavor which is liked by some." Of course, there are always chances for inaccuracies in reports; and while the reporter took my rambling remarks with ordinary accuracy, he made me say some things that I did not intend to say. What I actually said, or at least thought I said, was that *some* Southern honey has a strong flavor.

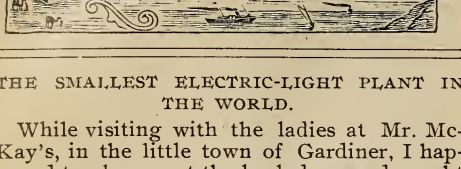
In the general discussion, we were talking about the peculiar flavors of different honeys, and why some preferred a kind of honey that another disliked. I mentioned the fact that buckwheat honey in New York is preferred by some to any thing else, and that, in a similar way, there are certain flavors in Southern honeys that are liked by some and disliked by others. Bro. Hill says he would not for a moment attribute to me the "thought of a willful misrepresentation," and that he believes I am "utterly incapable of studied deception." I thank him most sincerely for such a statement; and while I may not deserve it, I try to be what the language implies.

DOOLITTLE'S LATEST FEATS IN QUEEN-REARING.

G. M. DOOLITTLE, in a private letter, referring to his book on queen-rearing, says:

"Scientific Queen-rearing" cost me five of the best years of my life, as that number of years were given up almost wholly to that work, as far as deep study and experimenting and planning were concerned; and ten years of work since along that line, without a single failure, with one *single* batch of cells, has proved the soundness of what I dug out. Letters have come to me from all over the world, and are still coming, fully equal to those of the first two or three years, telling of the great success obtained by the plans given in the book. This summer I have excelled any thing I ever did before. I prepared just *one* colony for cell-rearing the latter part of May; and this one colony, having a laying queen below all of the time, has raised me a batch of 18 queen-cells, every three days, ever since, up to the tenth of this month, at which time I started the last batch of cups for this year. I find by my tally-sheet that the average number of cups given each three days was 21, and the average number of queens obtained was 18. So you can see how successful it has been with me during nearly four months in succession. And there are many others who say they do nearly or quite as well. The beauty of the whole thing is, every queen-cell and queen is perfect, and fully equal in every way to those reared during natural swarming, where nature does her level best. No cells were ever moved from this one colony, from the time the cups were given till the ripe cells were taken away.

Borodino, N. Y., Sept. 28. G. M. DOOLITTLE.



THE SMALLEST ELECTRIC-LIGHT PLANT IN THE WORLD.

While visiting with the ladies at Mr. McKay's, in the little town of Gardiner, I happened to glance out the back door, and caught a glimpse of the Yellowstone River. In reply to some questions, Mrs. McKay said the Yellowstone and the Gardiner Rivers united just at the foot of the mountain, and I soon climbed down. The first thing that met my sight was a man wading in the clear water of the Gardiner River, fixing up a sort of dam with stones, to turn a part of the water into a sort of race, or irrigating-ditch, that ran along the side of the hill; but the speed of the water along this flume, or race, made me think it was not for irrigating purposes after all. The stranger informed me, in answer to my questions, that this water in the race carried a little water-wheel that pumped water up into the town, and also carried a little electric-light plant. He said he had been told that it was the smallest electric-light plant in the world. He courteously showed me over the plant, and started it up. The water-wheel was only an ordinary overshot wheel, much like the old-fashioned water-mills. It could be arranged to run the pump or a dynamo, either one or both together. The current ran up the hill, then branched out around the town to light the houses. It seems to me the expense of the whole plant could not very much have exceeded $500, and yet here were water and light both, carried up the hill to the little village of perhaps a hundred inhabitants.

BOZEMAN, MONTANA, AND ITS VICINITY.

In the Home Paper in our last issue I spoke of crossing the Rocky Mountains on my wheel, for I found that it was indeed the Rocky Mountains up one side of which I climbed and then down the other, after that precious gift of physical strength—at least the little book called "Wonder Land," published by the Northern Pacific R. R. Co., says it was the Rocky Mountains. Over the mountains on the western side I came down into the Gallatin Valley; and going down that mountain canyon was one of the most delightful experiences I ever had in my travels. A great part of the road is cut in the mountain side, and it runs around first to one side and then the other, all the way going down hill; and there is something strange and weird in this queer thing I have mentioned before, where you get your sense of level mixed up. At several points it seemed as if the crooked roadway, and railroad as well, were really running down into a frightful abyss to the interior of the earth. If somebody had told me there was a spot in the world where a great hole went down to China by a zigzag course, I should have said this was the very spot. Several times I alighted from my wheel and looked down into that awful abyss with open eyes and open-mouthed astonishment. I knew it must be a sort of optical illusion, but it was just as grand, nevertheless. It really seemed as if my wheel would pitch headlong down this tremendous incline in spite of brake or any thing else—that is, it *looked* that way; but I knew by the effort to hold the wheel back that it was not so very steep after all.*

Part way down the incline there is one of the most beautiful springs I ever saw anywhere on the face of the earth; and this is a *real* cold-water spring. It comes out from the side of a great sandy rock or mountain; and the prettiest part of it is, the whole surface of the water is covered with a most magnificent growth of water-cress. I ate cress and drank spring water, and bathed my hands and face in the cooling liquid again and again. When you get clear down into the valley, the winding road goes off through shady woods alternated with fields of alfalfa and other grains.

It was a little after dinner-time when I reached the beautiful town of Bozeman. Here we have fine buildings, street railways, and almost all the improvements of an Eastern city. A little out of Bozeman, at the terminus of the electric railway, is the Montana Experiment Station. I had letters to some of the prominent citizens, and they very kindly left their business and went out with me to visit the station. The very first thing that caught my eye on entering the grounds was a plot of white clover grown by irrigation. I wish the bee-keepers of our land could all have a glimpse of this, and see what is possible in the way of growing clover. The heads were so exceedingly large that I should have called it a field of red clover had it not been for the shape of the leaves and blossoms. I am greatly indebted to Prof. S. M. Emory for his very kind services in showing me over the grounds as he did during my limited stay. To tell the truth, I should not have visited the experiment station at all had it not been for the fact that I had laid my plans so as not to travel on Sunday, so I had Friday and Saturday for explorations through the Gallatin Valley. It is a little singular that there are special localities in this great land of ours that are fitted for some one particular crop better than any thing else. Now, this valley seems to be the great place above all others for growing barley. We are told that 14,000,000 lbs. was shipped to Europe in 1896. It is also a great wheat country. Prof. Emory said, "Mr. Root, you can not grow wheat in the East for fifty cents a bushel; but we can grow it here in Montana at that price and do well." In fact, winter grains, all of them, can be grown nicely without irrigation. Here in Gallatin County a yield of winter wheat of fifty bushels per acre is not unusual; and I

*By the way, for climbing mountains it is of the greatest importance that the wheel have a good substantial brake. If something should give way, going down these terrible declivities, especially where you are making any sort of speed, it would probably be death to the rider. The brake on my chainless Columbia seemed to be all that could be desired.

am told the general average of the county for the years 1893, '94, and '95 was only a fraction less than thirty-eight bushels per acre."

Prof. Emory showed me some farming that was certainly ahead of any thing else I ever saw on the face of the earth — that is, in the way of grains; but this was under irrigation. Even field peas stood up almost as high as one's head, loaded with pods. The peas were grown for feed, and also for the peas themselves. With the help of these great crops, pork and beef are produced at a figure that it would be impossible to touch in the East. Of course, the expense of transportation to distant markets is a drawback.

I did not have time to examine the test-plot of potatoes as I should have liked, for I wanted to get the next car back to town. I was somewhat pleased to hear Prof. Emory's assistant say, in answer to a question of mine, that, all things considered, the Early Ohio was their best extra-early po'ato.

Prof. E. has not only some bright original ideas in regard to growing crops, but he showed me how to make comfortable buildings for stock, with a very small outlay in cash. First, log houses are built from the spruce timber that is so cheap and durable in that locality. Now, when you attempt to plaster up the cracks of a log house with clay or mortar the filling will always be dropping out. Prof. E. remedies this by nailing strips of lumber along the logs, one on the upper edge and another on the lower edge. By having them in such a position that a straight-edge just touches the logs as well as the strips, you will notice this will make the chinking so it can not crowd out. Such buildings are exceedingly warm, and well calculated to withstand the rigors of their cold winters. Another point: Prof. Emory says that, to avoid the criticism that farmers make when visiting the experiment station, that such work imposes a burden on the farmer by increased taxation, he says he has been so far enabled to state to one and all that the Montana experiment station has not thus far cost the Montana farmers one solitary copper. The crops that they grow, together with the government aid, has so far paid for all outgoes. Is there another experiment station in the United States that can say as much? I feel like congratulating the farmers of Montana, and I hope they will avail themselves of the wonderful object-lessons that are to be found all over the farm.

Oh, yes! Prof. E. has some bees. There are seven colonies, if I remember correctly; and to refute the oft-repeated statement that bees can never be wintered in such a climate, he has wintered them thus far in the open air, protecting them by a sort of shed or bee-house, and outside packing, something like a chaff hive, permitting the bees to go out through a chute whenever the weather permits. With all the other work he has on his hands, the bees, I judge, have not had very much attention; but they have given large yields of honey and a steady increase since they were purchased, about two years ago. No wonder they get honey, for there are acres of clover of all kinds in bloom, and so few bees to visit the clover that I jestingly said to him each bee could have almost an acre of blossoms to itself. What a contrast to our overstocked localities in the East, and also in many parts of Arizona!

The ladies told me at Gardiner, that, if I took that trip over the mountains on the wheel, I must surely visit the government fish-hatchery. This is out of the town, in an opposite direction from the experiment station; in fact, it is up a beautiful little canyon. As the good friends who went with me to the station could hardly spare the time, I went over on my wheel alone. One of them remarked that it would be easy wheeling, for it was down hill all the way; but as my pathway was for the whole four miles beside a mountain brook that was constantly running toward me, I did not exactly understand the "down hill" part of it. It looked down hill, but the brook said, "Not so." A great part of the road was sandy and dusty, which made it still more difficult. I was pretty tired and quite thirsty when I caught sight of the government fish-hatchery buildings; and here was another queer optical illusion. When I got over into that notch in the mountains I wondered why the government had placed its plant in a little narrow gorge where one could hardly find elbow room to turn around; but when you once *get there* you will find a nice plot of ground, a full half-acre in extent. Oh what a pretty place it is! A large spring has been diverted, and made to flow through a series of little square ponds. These are arranged with walks between them, much like our beds in market-gardening. The water goes through wire cloth when it goes in, and through wire cloth as it goes out, so the fishes are confined there. Oh what a beautiful sight! I thought there must be untold millions. In fact, they were like swarms of bees, or more so. In the first pool we have fishes about as large as cucumber seeds. The next are a little larger, then larger still, and so on. A great part of their time they spend in swimming up stream in the beautiful, limpid, pure spring water. The spring is large enough so the water goes through all the pools at a pretty good speed; and so while the fishes are swimming quite rapidly they are really standing still—that is, in respect to the visitor who stands in the path beside the pool.

I think I forgot myself several times so far as to ask where they kept the fish in the winter time. Each time, Prof. Henshall smilingly replied, "We keep them right here, just as they are. There is no winter nor summer to them. The temperature of the water never changes."

Does it not seem incredible, that, even though the weather should be 30 to 40 degrees below zero, these beautiful little speckled mountain trout six inches below the surface feel no change? I asked for a drink of water. You see my wheel-ride had made me thirsty. As it touched my lips I was startled. Said I:

"Why, surely this is *ice* water."

"No, the temperature is just 45—always 45."

I looked incredulously over the edge of the

dipper. At this he lifted a beautiful thermometer out of the water, and showed me the constant unvarying temperature of 45 degrees.

"Why, do you mean this never changes, winter or summer?"

"Yes, Mr. Root, it does change a little. It is colder in summer than in winter."

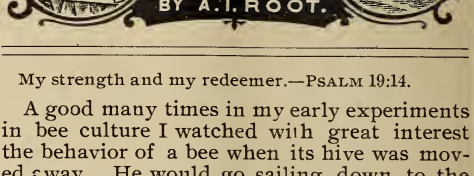
Now, I have heard such talk about spring water being colder in summer than it is in winter, from ignorant people; but I was surprised to hear this from a talented professor like my companion, who is in the employ of the government. He guessed my thoughts, and smilingly enlightened me.

"Mr. Root, this spring is the result of melting snows on the mountain. The snows are melting now, and sending down great streams of water through the rocks. Well, in winter a great quantity of snow collects; but the snow at the bottom, near the ground, keeps on melting all winter long. This keeps the spring running. But the greatest melting of snow into water is along when the hot weather commences, say May or June; then a larger quantity of water comes from the spring, and flows more rapidly. At such times the temperature might go down to 44 or possibly 43."

Now, these little speckled trout are the prettiest fellows in the world. In fact, I do not know of any thing that has life that is handsomer. I said there seemed to be *millions* of little fish; but I am told there are only about one-fourth of a million. Just about a million of eggs were shipped from the finest trout regions of Connecticut and Massachusetts, and from the million of eggs about a fourth that many fish will reach maturity. These fishes are used to stock the streams and lakes of Montana, and it is quite likely that the speckled trout that I had been enjoying with such extreme satisfaction the week before was the product of the United States fish-hatchery at Bozeman, Mont. From a little book entitled "Bozeman in the Rockies," I copy the following:

The jaded worker from eastern city or farm, whose unsteady nerve or suspicious cough or tormenting indigestion was making him pessimistic, is often transformed, as if by magic, into an animal whose daily climbing and eating are equaled only by his capacity for sleep. And this renewal of life, unlike the brief deception of drugs, is genuine.

I want to extend my thanks to Prof. Henshall for the exceedingly pleasant and valuable information he furnished when it was my good fortune to visit him. I was greatly pleased to learn that he was in former years connected with our fish-hatcheries at Sandusky, Ohio. He is well acquainted with the Castalia springs of this State, which I have described before in these pages, and, in fact, he is an enthusiast like myself in regard to the springs of our country, and pure-water supplies in general. By the way, right in sight of the hatchery, in the middle of the mountain brook, there has been discovered a warm spring. They are just now discussing plans to utilize this *warm* spring for growing fishes that require a higher temperature than do the mountain trout.



My strength and my redeemer.—PSALM 19:14.

A good many times in my early experiments in bee culture I watched with great interest the behavior of a bee when its hive was moved away. He would go sailing down to the beloved spot where its home had always been, with perfect confidence, and with light-hearted alacrity with its load of pollen, and possibly honey too. It expected, of course, to hustle in at the well-known entrance where he passed out and in hundreds of times a day without a thought of the possibility that its beloved home was in any way changed, much less taken away entirely. With what astonishment, sorrow, and dismay — nay, even fright — it hovers around again and again, but finds nothing! "Why, what does this mean? what *can* have happened?" Suppose you should some time hasten homeward with hurried steps, not thinking of any possible harm until you were at the very threshold of your door, just when you expected a bright welcome from the happy wife, and shouts of delight from the tidy little ones—suppose just when you were ready for the joyful welcome you should find the home gone — not a trace or vestige, only green grass or possibly a few rotten sticks where the home had always been until this moment—how would you feel? But with the bee the case is still worse. Suppose it is a member of a solitary hive, and it is a season of the year when there are frosty nights, then the loss of its home means death —*annihilation*, perhaps, of the happy busy little insect. If it can not find its home, and mingle with the crowd as one of the busy, humming, restless thousands, it is undone, lost. Sometimes I have seen them vainly exploring, and heard them uttering that well-known mournful hum. At such times I have seen them take wing away off at a distance, back to the fields again — that is, if the fields were not too far away. Then it swings around and says, evidently, "Now I am sure I am all right. There *can* be no possible mistake. I am on the right track I have known so well all summer long, and I must surely strike my home." The result is the same. It finally alights to take breath, and then crawls about disconsolately with its heavy load of pollen. The pollen is of no use; and, even though it be loaded with honey, *that* is of no use. The cool air reminds it that death is near, for that home can not be found. Blossoms loaded with nectar are of no account now. Every thing else sinks into insignificance. I have seen bees under such circumstances make several trips, apparently to make *sure* the terrible calamity had befallen them. Then I have seen them again in a little group at sundown near where the home stood, and there in the morning I have found them frozen stiff. Sometimes they can be revived, but usually not after a very severe freeze.

Where the young experimenter in bee culture has moved the hive only a few rods away, or possibly on the other side of the house, these lost bees will sometimes find their home; and, oh what frantic demonstrations they make when the home *is* found! One who has learned to understand bee-talk can readily take it all in. The half-chilled little chaps set up such a hum of rejoicing that it seems to warm their chilly little toes; and what a stampede takes place among their fellows when they hear the joyful sound, and hasten to the spot! It is said that bees that have once wandered about, lost for an hour or two, when they *do* find their home will not soon miss it again. This may or may not be true; but if the change in the location has not been too great they usually, after a few days—perhaps a week or more—become accustomed to the new spot. Some will go every day for some time, and hover around the old spot, apparently forgetting the hive has been moved, but the new spot will be found quicker this time. You see this home is of more importance to a *honey-bee* than to the rest of animated nature. Its very *life* depends on getting back into that busy crowd.

Well, I have been having some experiences of late that have made me think of the lost bee. More cares and worries have been resting on my shoulders during the past two weeks than for years past. During the summer and fall I had a long vacation, or two of them if you choose. I have sometimes thought they were providential in giving me health, strength, and endurance to carry me over the past two weeks. Perhaps I should explain a little to my friends who read these Home Papers. You have been told repeatedly of the immense amount of business that settled down upon us during the year that is just past. Our buildings were too small, our machinery was inadequate; our boilers, engines, shafting, and every thing else were tested to their utmost limit to enable us to get through the season's work; and, even during the fall, carload orders have come so thick and fast that we find it next to impossible to shut down long enough to put in a 400-horse-power engine.

Now, for some years past, as you may know, I have been letting my son and son-in-law (there are two of the latter now, and I think I may say there is a providence in *that* also) take charge of most improvements. In fact, I have not felt able, either physically or mentally, to shoulder the problems that come up constantly from enlarging our business. All along through the fall and summer we were discussing electric transmission as a means of conveying power to different parts of our premises. In fact, we some months ago installed a 30-horse-power dynamo, and conveyed the power in several different directions to test it. We first ran our entire machine-shop by means of a wire scarcely larger than a knitting-needle. Then we hitched another motor to our big printing-press, and, later, to a small press. The pressman simply turns on the current when he wants to use the press, and at all other times there is no rattling of belting and shafting. The composing-room is quiet until somebody wants to use the press. This is not only a saving in expense in transmitting the power, but there is a big saving in using no power to move useless machinery except at the very moment when the printing is being done. Then we use another little motor for pumping water from a well 600 feet distant. On the way to the pump, the wire is run down into a warehouse, and still another motor there operates the elevator; and the little machine does its work perfectly in hauling up great loads when its services are wanted, and at other times stands quiet and still. We had practically demonstrated that electric transmission is *the thing* for carrying power to distant points on our premises.

Well, when it became desirable to locate our largest planer, requiring something like 40 horse power, at the further end of our sawroom, right adjoining the lumber-yard, the boys asked me what I thought about electric transmission. You know electricity has always been a craze with me. I said, "Get all our ranch into this sort of transmission as speedily as possible," without giving the matter very much thought. Ernest said one day it would cost a thousand dollars, while the old-fashioned way of conveying power would not cost half as much. I said, "All right; go ahead." After a while it wanted $1500; then $2000; then $2500; then $3000 to equip nearly the whole factory, anticipating our future needs so we would not need to tear down and build larger again in a few years. Well, after the machinery was ordered, walls taken down, and things turned upside down generally, for the new apparatus, we were appalled to find that the switch-board alone for all these motors and dynamos would cost over $250—an amount that would almost have purchased a steam-engine to do the work right on the spot beside the planer. Then an electrical expert said the *wires* alone to convey the power to the requisite spot would cost *$170.** Somebody who rather favored the old plan of working said the copper wire itself would cost enough to buy *two* belts to transmit the same horsepower, and we began to be sick of our undertaking. The heaviest part of the responsibility devolved upon myself as president of the institution, because I said continually, "Go ahead." People who had other kinds of machinery for sale—rope transmission, etc.—said a *quarter* of the money would have equipped us nicely, only that electricity is the fashion, and high-toned, etc. We went all over the figures. Different authorities declared that belting would not be satisfactory in the end—that we had better put in machinery right while we were about it.

Let me pause right here long enough to say that I am still satisfied that blunders are often

* A little further explanation may be needed here. Our apparatus is run by an exceedingly low voltage on account of the danger from fire in a wood-working establishment. For instance, our dynamo gives a current of 110 volts, and hence it does not endanger human life. Usually, in transmitting power, they go up 250 or 500 volts; and the current that goes from Niagara Falls to the city of Buffalo is somewhere about 10,000 volts intensity. The higher the voltage, the smaller the wire and the less the expense of wire.

made in putting more expense into machinery than is needed. I know it is a bad thing to build too small and cheaply; but I do think there is another sad extreme. In our own town waterworks, which are very nice, and work beautifully, in my opinion they put in an engine and boiler at least twice as large as they needed. In fact, it is *four* times as large as they need to pump all the water there is in the well. If the well gives a larger stream the longer it is used, may be the apparatus is all right; but I do think there is a good deal of useless extravagance in much of the machinery put in for public use.

Now, friends, I have told two different stories. Perhaps they are both interesting and instructive; but I should not wonder if not one in ten of my readers sees the connection. *Where* are the wires that are to connect the "dynamo" and the "motor"? Well, the connection comes in right here. Some people who ought to know said we had not *only* invested $3000 where less than a third of that sum would have done the work, but for all time to come we are going to be handicapped by the fact that a copper wire to carry our power where wanted would cost more than belting and shafting. Still further, the electric people all admit that it costs nearly ten per cent to convert steam power into electric power, and another ten per cent to get back again from electric power to mechanical power. Ernest, John, and myself had wasted a great lot of money, or at least it looked that way; had got our buildings and machinery all torn to pieces right in the month of November, with cold storms upon us, and no apparent method of retreat. To go ahead was disaster, but to back out was worse. We were like the little bee in my opening story At the very outset I began to pray about it. Satan whispered that *this* was a matter that the Lord could not manage. He said that, even providing God *did* hear and answer prayer, when folks pushed ahead in a sort of foolhardy way, the only way to teach them better was to let them suffer, as a just and fair punishment for their stupidity. I quoted Scripture texts; I referred him to past experiences through all my religious life, and I said the dear Savior had not only been a very present help in trouble, but he had taken care of my blunders, and even of my stupidity, and brought forth good fruit from a thousand things that had seemed at the time to promise only disaster. A few weeks ago I prayed for physical strength; now I prayed most earnestly for wisdom and understanding—*mechanical* wisdom if you choose. I do not know but I prayed more earnestly for help, and emancipation from our troubles, than I ever did for any thing in the same number of days before in my life. I feel almost ashamed to say this, because there are much greater troubles in this world than such as I have described. But this one had to be met and answered at once. Machinists, wood-workers, carpenters, masons, electrical experts, and a lot of other people, amounting in all to nearly a hundred, kept saying by their actions if not by their words, "Well, what are you going to do about it?" I said, "We will tell you after a little." What I meant by "after a little" was after I had *prayed* more earnestly over the matter. The wisdom I asked for did not come, and I became somewhat discouraged, and began to lose faith. I felt like the bee that had lost its home.

For little periods of time I considered pushing ahead through this world of trial and discouragement with my own weak brain and feeble strength and endurance. My health began to fail. I lost my appetite (I guess the real truth is, friends, I lost it for only a few hours); finally I could not sleep nights. Then I thought of the lessons in the Bible in regard to importunity. I remembered that passage in the 36th chapter of Isaiah, 7th verse, where Rabshakeh, the captain of the Assyrian army, jeered and ridiculed God's people because they believed he would hear and answer their prayers. I told the dear Savior that I was ready to do any thing he wished — give up business, devote my life to work in his service in any part of the world he would indicate; and I plead with him that, for the boys' sake — the boys whom I had innocently led into trouble — he would hear my prayer and at least give me peace. I asked him to forgive my lack of faith, and to help me in my efforts to trust him. I thought of the words of our little text—"my strength and my redeemer"—my *home*. I said in substance, "O Lord, even though I have been thoughtless, perhaps foolish and worldly, give me back my *resting-place* in thee." Then I thought of the words David so often used, "Turn not thy face away from me;" and I rejoiced in hunting up such passages — passages that had always been strange and incomprehensible to me before. Dear reader, do you guess the outcome? Peace and tranquillity came *before* the question was solved at all. I told the dear wife that God was going to bring it about all right, but I did not know exactly how. I told the boys I wanted to consult an electrical expert who had no interest in furnishing either kind of machinery. He came, and I propounded my questions. Said I, first:

"If you wanted to convey 100 horse-power 100 feet from the engine, which would be cheaper—electric transmission or belting and shafting?"

"Electric transmission will be about as cheap, and a great saving of power, especially in your case, as you wish to make a quarter-turn in conveying the power."

Then he looked over our "predicament," and said that, under the circumstances, as we were equipped already with belting and shafting, the latter would have been very much cheaper — especially at first cost, but that, all things considered, especially the probable future developments of our business, he thought the boys and myself had adopted the best plan we probably could have done, only that, in many of the little details, there could be modifications that would save us expense. For illustration: In just a few minutes he devised a plan for cutting down $50 worth of wire; then he cut down $50 on the switch-board, and so on. He went on making changes and

short cuts for almost a whole day. Oh what a feeling of relief it was to me to find that we *had* been acting wisely after all! I felt like the bee that had found its home, and I have been thanking God ever since for that *home*, unchanged, and grounded now more firmly on the solid rock than ever before. In the case of the bee, his home was taken away by outside influences. In my own case the dear *Savior* was right there, ready as he always has been, a very present help in time of need. *I* was the one who was truant. With all my teachings, and with all these years of experience, I was ready to doubt, simply because I thought I had innocently blundered.

Just when I was most distressed and troubled about this thing — yes, when I was praying most earnestly over this business entanglement—a message came from my old pastor, Bro. Reed, asking me to come and talk in a little town where he had been holding meetings. He wanted me to speak on business and religion. He said the business men had all agreed to shut up their stores and all their places of business, to come and hear me talk. At first it seemed as if I could not possibly leave my home at such a time. In fact, I was so beset with doubts and worries that I really had nothing cheerful to talk about. I thought of Jonah, and of God's servants in olden time who excused themselves and refused to do his bidding. What I did do was to say, "Lord, help!" and then I started off to meet my appointment at a place a little difficult of access. My talk did *me* good; and, judging from the looks of the churchful of bright, intelligent people, my talk was helpful to them. I decided that I would listen to God's call, whatever it cost, and trust him for the outcome; and it was just about at this time that peace and faith came. I do not mean to tell you, dear friends, that *all* my burdens and anxieties have been lifted from me. I do not believe it is God's will that I should be spared from all anxieties and worries, for they, above all other things, drive me to the feet of the dear Savior—to that home, that haven of rest. After every such encounter as I have told you of, that "home of the soul" seems to me more precious. Without it I should be lost and ruined. With the great God of all the universe by my side to consult and confer and advise with, I am happy, and thank him every day for having given me a human life to live. But if I had to fight my battles alone with my feeble understanding and wisdom, with my frail physical frame, I should be lost and ruined and undone. And the greatest and most glorious part of it all is, that the invitation is not to me only, but to every child of humanity.

Come unto me, all ye that labor and are heavy laden, and I will give you rest. Take my yoke upon you, and learn of me; for I am meek and lowly in heart, and ye shall find rest unto your souls. For my yoke is easy, and my burden is light.—MATT. 11:28, 29, 30.

You see this invitation covers *all*, and, like the solitary bee, we are finally to be gathered together in one fold, where misunderstandings, jealousies, and vexations of every kind are known and heard no more.

POTATOES DURING 1898.

I have several times spoken about getting nice potatoes, planted after taking a crop of strawberries from the ground. Some time near the first of July, after we had made our last picking of berries from that rich creek-bottom ground, we plowed under about a quarter of an acre, and planted it to Manum's Enormous potatoes. Of course, the berries had been heavily manured, and mulched with coarse manure during the winter. The patch had borne over two full crops. When we decided to plow up the strawberry-patch, clover, weeds, and every thing else were allowed to grow; but we planned to get them under ground before any weed could mature seed. The prickly lettuce is the worst weed we have in getting into seed before we know it; but we hold it back by mowing the tops off; and after we get weeds, berry-plants, coarse manure, and every thing else nicely turned under, in go the potatoes. One of the specially good things about the Enormous is that it will keep solid and firm clear into July, and almost without a sprout, and yet when planted they usually sprout very promptly, and almost without a failure — that is, where the seed is cut to two eyes. We had a pretty severe drouth in July; but when the rains in August set in, the potatoes were "a thing of beauty;" and they were growing bright and green, a great part of them, until the 27th of October; then we tried to find a day dry enough to dig them, but did not find it till this 3d day of November. Oh what a sight it was to see the potatoes roll out! There are quite a lot of them that weigh between two and three pounds each, and scarcely a small one in the lot, and not a scabby one—at least, I have not noticed any. And, by the way, these late-planted potatoes are almost always smooth and clean. Of course, the weather has been exceedingly favorable — that is, there was no frost until toward the first of November, and no lack of rain since August. In fact, there has been too much rain if any thing.

For once in the world I let my big German friend have his own way about hilling up. He hilled them up again and again, making sharp mountains of every hill, with a sharp valley between. With the great amount of wetness this time, this happened to be just right, and he kept the potatoes covered so there was almost not a sunburnt one in the lot. We have just put them into the cellar, and the yield is very close to 100 bushels from the quarter-acre. It would have been more than 100 had it not been for a little circumstance. The piece of ground was not all covered with strawberries. On one side there were several rows of Gault raspberries. Some of the friends have complained because I have not reported in regard to these as I should have done. If you will look over our back numbers, however, you will find that I have

several times said the Gault never did as well on our ground as on that of the originator. Perhaps my soil is too low and too rich. But, worst of all, we have had to abandon growing all kinds of black-cap raspberries on account of anthracnose, and the Gault was no exception. But let us now go back to the potatoes.

A great many people are surprised to see me plow under not only raspberries but blackberries, when they are as high as the horses' backs. We do it with a plow specially made for this purpose. With a heavy log-chain, and a good stout man like my German friend to follow and put the brush under with soil over it, with his big heavy feet, we succeed in getting every brush and brier out of sight, and usually have fine crops of potatoes where we turn the berries under. This time, however, with the drouth that followed just after planting, the large amount of brush made the ground so dry that not half of the potatoes started at all. The part that did start, however, received such extra care by hilling, etc., that the vines finally covered the missing spaces, and we had an astonishing yield for the small number of hills of potatoes. On this same strip of ground we planted also the potatoes from Maule that were grown in the greenhouse last winter. The experiment came very near being a failure, however, because the new green potatoes taken out of the greenhouse would not sprout right away. In fact, almost none of them sprouted until they had been planted about a month. Then occasionally one would come up, and so on, all through September and October. We took great care of them; and, even with all these drawbacks, we secured three bushels, and some of them weighed 2 pounds apiece. From the one potato that Maule let me take for experiment last winter, I have now three heaping bushels —or, rather, Mr. Maule has, for the potatoes belong to him and not to myself. I have proved this, that potatoes may be grown in a greenhouse over winter, and the potatoes thus grown may be planted so as to raise a crop the summer following.

The worst drawback in my experiment was, as I have mentioned before, that I put the potatoes in some soil that had been on the benches for five or six years. Had I used new soil from outdoors, I think I might have had two or three times as large a crop from one potato.

Now, friends, here is where the "high pressure" comes in: That little piece of ground gave us a splendid crop of strawberries in June, and a *magnificent* crop of potatoes in October, and we are now preparing to put in rye, and in a few days I expect to see the ground green with the third crop in one season, outdoors. By the way, this new potato of Maule's looks considerably like the Enormous, and behaves much like it, only it is a red or reddish potato, instead of white, and I think it is more disposed to be prongy than the Enormous. The great amount of rain, however, during this past season, has made many potatoes badly shaped that would otherwise have been smooth and round. Our potato crop, however, is a splendid one, especially the late-grown sorts. Nobody succeeded, if I am correct, in growing extra-early potatoes *planted early*.

SCABBY POTATOES.

A year ago I was unfortunate in selecting a piece of ground for my test-plot of early potatoes. They were so scabby that a great part of them were apparently unfit for any thing. Some varieties, it is true, were worse affected than others; but nearly all of them were very bad. As an experiment I took a peck of each kind and treated them with corrosive sublimate, and planted them on a piece of ground where the potatoes had never been affected by scab, and the result was a nice lot of potatoes. The scabby seed, after treatment, seemed to be just as good as any. Some nice clean potatoes, however, planted where scab had been so bad last year, were very badly affected, but not as badly as last year; and this piece of ground that seems to be so badly affected by scab was very heavily treated with sulphur three or four years ago. These experiments seem to prove that corrosive sublimate kills the scab in potatoes; but sulphur does not kill scab fungus in the ground—at least, not with us. My experience is that potatoes planted late, say toward the first of July, are very much less liable to be scabby.

BUDDING POTATOES.

I clip the following from *American Gardening* for Sept. 3:

The Rhode Island Experiment Station reports an interesting experiment on budding potatoes for the purpose of hastening their maturity. The results showed very favorably for budding. Not only did the potatoes from the budded seed mature earlier, but the yield was very much larger, showing an average increase for the budded seed of about 44 bushels an acre.

The process of budding is described as follows: The most desirable tubers for budding are those about the size of a hen's egg, sound, and not mutilated in digging. They may be reserved for the purpose when digging the previous crop, and, if allowed to become greened by exposure to sunlight, so much the better, or they may be selected from the bin at any time. During stormy days, or at any convenient time during the winter, these seed tubers can be placed in the trays and then stacked up anywhere in the cellar, secure from rats and frost until wanted. The tray to be filled is placed upon a box or bench, and one end elevated about a foot by placing a box or measure under it. Then, beginnning at the lower side, the potatoes selected are carefully packed into the rack, stem end down, as closely as possible, one layer deep. Tubers cut or pierced by the tines of a potato-digger or fork should not be used, as they are likely to produce sickly or inferior buds.

About six or eight weeks before planting-time, the rack should be placed in a warm and light place, where there is no danger of frost, or damage from rats and mice, and the tray placed in the rack. If the temperature is moderate, 60 or 75 degrees, and a fair amount of light reaches all parts of each tray, no further attention is necessary; they do not require watering. After a few days tiny white points will be seen at the eyes of the tubers, and a few days later it will be noticed that one and often two buds on each tuber will have made more growth than the others. These buds are far different from the white watery sprouts of potatoes kept in a dark cellar. They are thick, firm, and tough.

If conditions are right, at the end of six weeks they will be from half an inch to an inch in length, and from one-fourth to three-eighths of an inch in diameter, with many rudimentary roots at the base waiting for the moment when contact with mother earth shall enable them to burst forth and go about their work of gathering plant food.

This, of course, is only a condensed account of the plan outlined in our book on potato-

growing on the Island of Jersey; and we can add that, after testing the matter for several seasons, it is *the* plan for growing tremendous crops of extra nice potatoes. It is true, it takes more seed, but there will be no missing hills; and, if the work is done properly, every hill will give a big yield. I may add that, in our practice, we use our potato-boxes slatted all around, placing another temporary bottom of slats half way up. Each box then holds two tiers of potatoes. After danger of frost is over we store them on the barn floor with the double doors on the north side wide open. Where seed is scarce and valuable the potatoes can still be cut to one eye, or, better, to two eyes. Now is the time to pick out potatoes of the proper size, and save them for next year's planting.

ECONOMIC GRASSES.

The above is the title of a very valuable bulletin from the Department of Agriculture, Washington. It describes, sometimes at considerable length, 252 grasses of more or less value, and 91 of them are very accurately pictured, so that any farmer would recognize them at a glance. It tells where they are valuable, and where they are found to be pernicious weeds. It tells what kind of grasses you want for hay, pasture, lawn, for wet lands, for embankments, and for holding shifting sands. In my travels I have studied considerably the grasses for different purposes. Since looking over this book I shall always look at them with still more interest. This family of grasses includes many things we might not suspect; for instance, millet, wild barley, broom-corn millet, chicken corn, Egyptian corn, Kafir corn, pampas grass, rice, sorghum, sugar cane, chess, teosinte, wheat, and, in fact, I do not know but pretty much all the family of grains come under the head of grasses, especially the wild uncultivated grains. If you want the above, write to the U. S. Dep't of Agrostology, calling for Bulletin No. 14.

KIND WORDS FROM OUR CUSTOMERS.

THE ANTI SALOON LEAGUE, ETC.

Dear Mr. Root:—I have just read your article in your issue for Sept. 15, on the saloon problem as it presents itself in Medina. It was especially interesting to me, as the Anti-saloon League work has just been brought to my notice this summer. I am working at present to get a local league established in our township. If we do, our first work will be to enforce the Sunday-closing law, and it is high time somethhing were done to stop the abominable work. Saloons in our vicinity treat this law with contempt, and the township officers haven't "man" enough about them to check them.

I was surprised and glad to know that you were so intimately connected with the Anti-saloon League, and pray to God that it may do as grand a work here in Michigan as it has in Ohio. I wish to be always identified with it. I thank you for the article in your journal, and hope you may have abundant success in keeping rid of saloons in Medina. E. M. HUNT.

Bell Branch, Mich., Sept. 18.

A KIND WORD FROM ZULU LAND; SUPERSTITION AND FRAUD NOT CONFINED TO AMERICAN SHORES.

Dear Brother Root:—In your noble fight against superstitions and humbugs it may encourage you as well as strengthen your cause to know that you have sympathizers in such a far-distant land as Natal, South Africa. It may be expected that the Zulus should have some absurd notions as to pathology, and we can easily see the uselessness, not to say harmfulness, of the nostrums which they suppose to have a wonderful effect on the human body. We pity their ignorance and superstition; but, judging by the humbugs which you are continually exposing, it appears that many people in Christian lands are not far behind the Zulu as to superstition.

You remember that wonderful "Hall's remedy" which you showed up several years ago. Before I had seen what you had said about it I was then in America, and, visiting a brother-minister, he was very anxious to sell me that wonderful secret. He said the usual price was $8.00, but he would let me have it for $4.00. But I did not take on at all. I told him, in the first place, it did not look reasonable. "If Dr. Hall is a Christian, as he professes, why does he charge $8.00 for a book which could be sold for five cents at a large profit?" That was not my idea of Christian benevolence. But my friend hung on to me so persistently that I finally took out $4 and laid it on the table, and told him, "I do not want the remedy for myself; but if it is as good as you claim take this money, and, when you find some needy person whom you can help by this remedy, you may give it to him in the name of the Lord." He would not take my money, and I suppose he did not carry out my scheme of benevolence; but he did not bother me any more. The next number of GLEANINGS I received after that contained your criticism of this remedy. I sent the magazine to my friend, with the article marked. I have not heard from him since.

You would think educated men and ministers of the gospel ought to have more sense, not to speak of honesty. But then, there are so many testimonies of cures. Yes, so there are for all the medicines of the witch doctors here. Let me tell you what some of these medicines are: Snakes' bones, hyena fat, crocodile claws, roots, and bones of all sorts hung about the neck or on the wrists. One kind of medicine is made of the sweat and dirt scraped from the body of the doctor. Another is made of the vitals of human victims waylaid for the purpose. Of course, the English government is supposed to prevent practices of this kind; but the police officer can not account for every mysterious disappearance. I know of one very sad case of this kind. A farmer's child was missing one day after a little party which had been made for one of the children. Days and nights were spent in search by the agonized parents, assisted by their neighbors. That was many years ago, and nothing has ever been seen of the child since; but it is the firm conviction of the father, corroborated by different circumstances, and the testimony of a dying native, that the child was murdered by a native doctor in the vicinity, to be used as medicine. This is all very horrible; but the strangest thing about it is, that these medicines do seem to have a powerful effect, and it is impossible to convince our most intelligent native converts that they do not. I once had a long talk with one of our most advanced native preachers on the subject. I tried to show him that it is all in his mind; that snakes' bones and hyena fat, and all that sort of trash, can not have the effect that he supposed. "Yes, master," said he. "I know it seems very absurd to you; but I must believe what I have seen." Then he went on to tell me of cases which had come to his knowledge. One was a letter that had been doctored. He first looked at it himself, not knowing that it had been doctored, and it made his eyes as red as blood. Then two more members of his family looked at it, and each in turn, as his eyes gazed on the fatal page, fell down in a fit. Nevertheless, this letter which had such a powerful effect on those who looked at it had been handled and carried twenty miles, and did not affect the messenger at all.

Another case was that of a young lady colonist. She had been sick for a long time, and tried many doctors and medicines without relief. Then in a freak she called a celebrated native doctor. He examined her, and said, "I do not know that you are like the black people; but if you were a Zulu girl I should say your trouble is from a lover. It is just like what I have seen when a disappointed lover revenges himself on his mistress with evil medicine."

"Why," said the lady, "I believe you have hit the case exactly. I did disappoint a lover and I believe he is now using medicine to make me sick in this way. But can you do any thing for a complaint of this kind?"

"Oh, yes! if that is what is the trouble, there is medicine to counteract the evil influence of the one who is trying to punish you."

So she was treated for this complaint, and in a very short time she was restored to perfect health.

So you see how the witch doctor can get just as much testimony for the marvelous power of his medicines as we have given for the most popular patent medicines, and, in my opinion, the one is quite as effective as the other.

I must close now; but if this communication should prove to be of any interest to your readers I may venture another at some future time, on my experience with a bicycle in the mission field.

Groutville, Sept. 6, 1898. W. C. WILCOX.

Wants and Exchange.

WANTED.—To exchange bicycle for Barnes' foot-power saw, or engine
ROBERT B. GEDYE, La Salle, Ill.

WANTED.—To exchange for 500 lbs. of good white granulated extracted honey, one Smalley feed-grinder, as good as new; catalog price $65.00.
WALTER HARMER, Manistee, Mich.

WANTED.—A location for a custom saw and feed mill. WM. S AMMON, 216-18 Court St., Reading, Pa.

WANTED.—To buy quantity lots of fancy and No 1 white comb honey, car lots preferred.
BYRON WALKER, Evart, Mich.

WANTED.—No. 1 white comb honey in 4x5-inch sections; also to furnish my hives and 4x5 sections for a share of the next honey crop, to parties within 100 miles of this city. Address *at once*
F. DANZENBAKER, Washington, D. C.

WANTED.—To buy, rent, or lease a place in the South with bees, in location suitable for queen-rearing; same must be free from all bee disease. Will pay cash for white comb honey.
H. G. QUIRIN, Bellevue, Ohio.